A Descriptive Study of Selected Mother and Infant Behaviors on the Day of Delivery

By

MARY ELIZABETH HILLIARD

A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF
THE UNIVERSITY OF FLORIDA IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA
1973

This dissertation is dedicated to my parents, Dorothy and Raymond Hilliard, with pride. Their wise support and encouragement over a lifetime have made this endeavor possible.

ACKNOWLEDGMENTS

No dissertation is the work of a single person, and, as doctoral students before me, I seek the best way to acknowledge this fact. Among the very many persons who listened, advised, encouraged and taught me, I would like to pay special tribute to:

Dr. Ira Gordon, the chairman of my committee, for his patient guidance, his quick and analytical appraisals of my work, and his generous sharing of his knowledge and time.

My committee members, who were consistently interested, wisely critical, and understanding.

Pat Schlenker, of the IDHR Staff and Jean Holzer, of the Computer Center Staff, for their invaluable aid when I reached the point at which assistance in the intricacies of coding, computer use, and data reduction were necessary.

Tanya Sroka and Lynn Hardy, who helped me to establish inter-observer reliability, made very helpful suggestions referent to the development of the final list of behavioral variables, and contributed to the data collection.

Dr. Hal Lewis who, initially, helped me to undertake doctoral study.

Dr. Vynce Hines, who 'took over' the chairmanship of my committee during Dr. Gordon's absence.

Helen Adamson, who patiently typed and retyped, so that this document would be as perfect as possible.

Finally, the nursing staff and the mothers and babies who participated in this research should be thanked for their willingness and interest. Without their considerable help, there would have been no study.

This study was supported during the years 1971 and 1972 by the Department of Health, Education, and Welfare, Special Nursing Fellowship, numbers 1F04-NU27,395-01 and 5F04-NU27, 395-02.

TABLE OF CONTENTS

		Page
ACKNOWLEDGMENTS		iii
LIST OF TABLES		vii
LIST OF FIGURES		xiv
ABSTRACT		xv
CHAPTER I	INTRODUCTION AND STATEMENT OF PROBLEM	1
CHAPTER II	REVIEW OF THE LITERATURE	8
	Mammalian Studies of Mother-Newborn Infant Behaviors	12
	Studies of Human Mother-Infant Behaviors	18
	Literature Review Pertaining to Methodology	30
CHAPTER III	PROCEDURE AND TREATMENT OF THE DATA	35
	Preliminary Considerations	37
	The Sample	37
	Description of the Population	38
	The Selection of Mother-Infant Couples	39
	Basic Pertinent Data	42
	The Observation Instrument	44
	Selection and Definition of the Dependent Variables	45
	The Establishment of Observer Reliability	48
CHAPTER IV	ANALYSIS AND DISCUSSION OF THE DATA	54
	Differences Attributable to Maternal Parity	82

Differences Attributable to Race 85

Differences Attributable to Infant Sex 88

Differences Attributable to the Mother's Perception of Her Labor Experience 91

Differences Attributable to the Mother's Perception of Her Sleep Adequacy 93

Differences Attributable to the Mother's Previous Handling of the Baby 97

Summary 99

CHAPTER V SUMMARY AND CONCLUSIONS 103

SUMMARY 103

CONCLUSIONS 114

APPENDIX A Consent Form 118

APPENDIX B THE FAMILY CENTERED MATERNITY UNIT 119

APPENDIX C TABLE 36 121

APPENDIX D BASIC IDENTIFICATION DATA 123

APPENDIX E Development and Use of a Tool to Improve Accuracy in Observing and Recording Human Interactive Behavior 124

APPENDIX F Original List of Dependent Variables 127

APPENDIX G Dependent/Independent Variable Combinations Subjected to Analysis of Variance and Found Not Significant. 128

APPENDIX H Raw Data Tables 132

BIBLIOGRAPHY 176

BIOGRAPHICAL SKETCH 182

LIST OF TABLES

Table Page

1. Characteristics about Population Based on Delivery Records: July, 1972, to January, 1973, and Comparison with Study Population 40

2. Summary of Characteristics of Study Population Divided According to Independent Variables 41

3. Percent of Agreement between Author and Observers on Observations of Six Cases: Test #1 51

4. Observer Reliability on Separate Items Across the Cases: Test #2 52

5. Observer Reliability between Author and Separate Observers: Test #3 53

6. Total and Mean Frequencies of Behavior for 26 Mothers 55

7. Total and Mean Frequencies of Behavior for 26 Babies 56

8. Comparison of the Overall and Interactive Frequencies of Maternal Behavior 62

9. Ranges of Mother Initiating and Responding Behaviors 64

10. Comparison of the Overall and Interactive Frequencies of Infant Behaviors 68

11. Ranges of Baby Initiating and Responding Behaviors 70

12. Frequencies of Maternal Handling Modes during the Observations Sessions 74

13. Percent of Time a Baby Initiating Behavior was not Responded to by the Mother 79

14. Analysis of Variance: Disinterested Feeding by Parity 83

15. Analysis of Variance: Feeding Frequency by Parity 83

16. Analysis of Variance: Eye Contact Attempt by Parity 84

17. Analysis of Variance: Encradling by Race 86

18. Analysis of Variance: Eye Contact Attempt by Race 86

19. Analysis of Variance: 'Smiling At' by Race 87

20. Analysis of Variance: Baby in Arms by Race 87

21. Analysis of Variance: Baby Yawn by Race 89

22. Analysis of Variance: Baby Sighs (Initiating) by Race 89

23. Analysis of Variance: Baby Eyes on Mother by Race 90

24. Analysis of Variance: Baby Movement by Baby Sex 90

25. Analysis of Variance: Baby Suck (Initiating) by Mother Labor Perception 92

26. Analysis of Variance: Change of Baby's Position (Responding) by Labor Perception 92

27. Analysis of Variance: Eye Contact Attempt by Labor Perception 93

28. Analysis of Variance: Baby in Crib by Mother Sleep Adequacy 94

29. Analysis of Variance: Baby Movement by Mother Sleep Adequacy 94

30. Analysis of Variance: Baby Sigh (Initiating) by Mother Sleep Adequacy 95

31. Analysis of Variance: Caring For by Mother Sleep Adequacy 95

32. Analysis of Variance: Rocks (Responding) by Mother Sleep Adequacy 96

33. Analysis of Variance: Palming (Responding) by Previous Handling 97

34. Analysis of Variance: Baby Movement (Initiating) by Previous Handling . . . 98

35. Analysis of Variance: Baby Eyes on Mother by Previous Handling 98

36. Summary of Characteristics Used as Independent Variables for Individual Subject Pairs in Study Population 121

37. Total and Mean Frequencies and Standard Deviations for Mother Variable - Lying in Bed 133

38. Total and Mean Frequencies and Standard Deviations for Mother Variable - Sitting on Bed 133

39. Total and Mean Frequencies and Standard Deviations for Mother Variable - Chair . 134

40. Total and Mean Frequencies and Standard Deviations for Mother Variable - Standing 134

41. Total and Mean Frequencies and Standard Deviations for Mother Variable - Sleep 135

42. Total and Mean Frequencies and Standard Deviations for Mother Variable - Changes Baby's Position 136

43. Total and Mean Frequencies and Standard Deviations for Mother Variable - Hugs/ Kisses 137

44. Total and Mean Frequencies and Standard Deviations for Mother Variable - Inspects 137

45. Total and Mean Frequencies and Standard Deviations for Mother Variable - Palms 138

46. Total and Mean Frequencies and Standard Deviations for Mother Variable - Encradles 139

47. Total and Mean Frequencies and Standard Deviations for Mother Variable - Finger Caresses 140

48. Total and Mean Frequencies and Standard Deviations for Mother Variable - Eye Contact 141

49. Total and Mean Frequencies and Standard Deviations for Mother Variable - Puts Baby on Shoulder 142

50. Total and Mean Frequencies and Standard Deviations for Mother Variable - Baby By Side 143

51. Total and Mean Frequencies and Standard Deviations for Mother Variable - Rocks, Shakes, Bounces 144

52. Total and Mean Frequencies and Standard Deviations for Mother Variable - Pats. . 145

53. Total and Mean Frequencies and Standard Deviations for Mother Variable - Imitates 146

54. Total and Mean Frequencies and Standard Deviations for Mother Variable - Looks At 147

55. Total and Mean Frequencies and Standard Deviations for Mother Variable - Smiles At 148

56. Total and Mean Frequencies and Standard Deviations for Mother Variable - Feeds 149

57. Total and Mean Frequencies and Standard Deviations for Mother Variable - Cares For 150

58. Total and Mean Frequencies and Standard Deviations for Mother Variable - Shakes Crib 151

59. Total and Mean Frequencies and Standard Deviations for Mother Variable - Talks To 152

60. Total and Mean Frequencies and Standard Deviations for Mother Variable - Talks About 153

61. Total and Mean Frequencies and Standard Deviations for Mother Variable - Gets Help 154

62. Total and Mean Frequencies and Standard Deviations for Baby Variable - Crib . . 155

63. Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Bed 155

64. Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Arms 156

65. Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Lap 156

66. Total and Mean Frequencies and Standard Deviations for Baby Variable - Asleep 157

67. Total and Mean Frequencies and Standard Deviations for Baby Variable - Awake 157

68. Total and Mean Frequencies and Standard Deviations for Baby Variable - Smacks Lips 158

69. Total and Mean Frequencies and Standard Deviations for Baby Variable - Mouths/ Grimaces 159

70. Total and Mean Frequencies and Standard Deviations for Baby Variable - Moving 160

71. Total and Mean Frequencies and Standard Deviations for Baby Variable - Tremor/ Shudder 161

72. Total and Mean Frequencies and Standard Deviations for Baby Variable - Cries . . 162

73. Total and Mean Frequencies and Standard Deviations for Baby Variable - Fusses 163

74. Total and Mean Frequencies and Standard Deviations for Baby Variable - Yawns 164

75. Total and Mean Frequencies and Standard Deviations for Baby Variable - Sucks . . 165

76. Total and Mean Frequencies and Standard Deviations for Baby Variable - Hiccoughs 166

77. Total and Mean Frequencies and Standard Deviations for Baby Variable - Sneezes 167

78. Total and Mean Frequencies and Standard Deviations for Baby Variable - Burps . . 168

79. Total and Mean Frequencies and Standard Deviations for Baby Variable - Spits Up 169

80. Total and Mean Frequencies and Standard Deviations for Baby Variable - Grunts/Sighs 170

81. Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes Open 171

82. Total and Mean Frequencies and Standard Deviations for Baby Variable - Blinks 172

83. Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes Shut 172

84. Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes on Mother's Face 173

85. Total and Mean Frequencies and Standard Deviations for Baby Variable - Turns Head to Mother 173

86. Total and Mean Frequencies and Standard Deviations for Baby Variable - Alert Feeding 174

87. Total and Mean Frequencies and Standard Deviations for Baby Variable - Disinterested Feeding 174

88. Total and Mean Frequencies and Standard Deviations for Baby Variable - Avoids Feeding 175

LIST OF FIGURES

Figure Page

1. Percent Curve for Three Modes of Handling During Thirds of the Combined Observation Sessions 75

2. Relationship Among Three Handling Methods During Thirds of the Combined Observation Sessions 76

3. Coding Sheet with Sliding Frame 126

Abstract of Dissertation Presented to the Graduate Council
of the University of Florida in Partial Fulfillment
of the Requirements for the Degree of Doctor of Philosophy

A DESCRIPTIVE STUDY OF SELECTED MOTHER AND INFANT BEHAVIORS ON THE DAY OF DELIVERY

By

Mary Elizabeth Hilliard

December, 1973

Chairman: Dr. Ira J. Gordon
Major Department: Foundations of Education

The purpose of this study was to describe mother and infant behaviors during a six-hour period on the day of delivery. It was designed to make direct observations of selected mother-baby pairs as a basis for examining the beginning sequences of their interactions and to obtain data which provide insights into the process by which the mother, as her baby's primary source of environmental input, influences his development.

The subjects were 26 normal mothers who had received clinic care, delivered normal, full-term babies, and were bottle-feeding. Each pair was 18 hours or less post-delivery at the time the observations were begun. There were 480 ten-second observations recorded for each subject pair, and 12480 observations for the total sample.

Data were collected relating to 27 infant and 25 maternal behavioral variables. Use was made of an especially designed frame which listed the variables and could be slid across the coding sheet. Data analysis was based on the following questions:

1. What are the frequencies of mother and infant behaviors?

2. What are the most frequent ways for a mother to initiate an interaction with her baby? What are her most frequent responses to his cues? What are the ranges?

3. What are the most frequent ways for the baby to initiate interaction? What are his most frequent responses to his mother's behavior? What are the ranges?

4. Do mothers follow a predictable pattern of handling their new babies?

5. What percent of the time do babies use initiating behaviors without being responded to?

6. Can differences in any of the above be attributed to the following independent variables?

   a. maternal parity
   b. race
   c. infant sex
   d. previous handling of the baby
   e. mother's perception of the labor experience
   f. mother's perception of her sleep and rest adequacy

There was great individual variability among the study pairs. As a composite group, the most prominent baby-centered maternal behavior was that of looking at the baby. Mothers obtained responses from the babies most frequently by changing their positions. They responded to the babies' cues most often by looking at them, as if to be sure they were all right, and by talking to them. The percent of tactile and kinesthetic maternal response behavior was considerably lower than the percent of visual and verbal response behavior. The mothers also exhibited a handling pattern which showed that encradling, finger-caressing and palming were all much higher in the first third of their contact period than later, and that encradling emerged in the final third as the major mode of handling.

The babies, as a group, cried very little and slept a lot. They initiated considerably more interactions than their mothers did, yet the disparity between the percent of response they received in respect to their cues and the percent of nonresponse was very large. A particularly interesting and frequent pattern of baby behavior was a combination of moving, mouthing, lip-smacking and sighing. Unless the baby fell back to sleep, he followed this pattern with fussing - and finally, crying. Crying was his most effective behavior in bringing the desired attention. Thus, the mothers responded at the end of a chain of his behaviors, rather than perceiving his early behaviors as significant.

When the variables were subjected to analysis of variance, too few were significant to be of more than heuristic interest. While there were no conclusive findings in this study, and the literature is also inconclusive, it is felt that providing mother-baby contact rather than separation is probably the more beneficial course to follow.

CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

Although medicine and nursing have been concerned about providing optimum care to childbearing families during the period of hospitalization, little active interest has been directed toward the ways in which a mother and infant develop their own unique relationship, nor in the quality potential of this relationship as a foundation for the baby's healthy physical and psychological development. The exposure of the normal full-term infant to a task-oriented routine of nursery care which separates him from his mother except for brief feeding/visiting periods is customary practice in most American hospital maternity units. Nursing personnel have usually focused upon providing a high quality of custodial care, rather than assisting the mothers toward their assumptions of the mothering role through activities centering on the importance of their earliest interactions with their infants. A major reason for this has been that nursing, paralleling medical practice, has had its focus upon the prevention and treatment of obstetric-associated pathology, and the goal of reducing maternal and infant morbidity and mortality. This has been a very necessary endeavor. However, the indications are that a time has come when there may be a need for a different theoretical rationale upon which to plan the kinds of environmental conditions and specific experiences needed by mothers and infants. This present research has been designed to collect data that will help to define more clearly, what these conditions and experiences might be.

Caring for infants has long been considered an intuitive art. It is supposed to be instinctive for a new mother to 'suddenly' know how to mother. Changing attitudes began to emerge over two decades ago. This has been demonstrated by various attempts to provide more flexible treatment to mothers and infants in hospitals. In 1950 Jackson described the impetus for the Yale Rooming-In Project (one of the first of these attempts) as arising from pediatric/psychiatric interests in the prevention of childhood behavior disorders, and from concern over the plight of mothers who . . . .

> complained of their lack of knowledge about the baby during the lying-in period and remembered unhappily their feelings of fear and ignorance on returning home from the hospital . . .
>
> In letters, in friendly conversation, in child-study groups, even in publications they (have) expressed surprise, disappointment and bitterness at the absence of essential help offered them during the hospital stay. Jackson (1950, p. 616)

Subsequent studies have indicated that there are still the same concerns and lacks today. A recent study by a group of maternity nurses (Cupoli et al., 1971) revealed that, despite the mothers' verbalized needs for assistance, postpartum and nursery nurses do not view teaching them about their infants' needs behavior and characteristics as being one of nursing's primary functions. This is, in part, due to the lag between theoretical knowledge in the area of the behavioral sciences, and in the clinical application of this knowledge to the health care of maternity patients. The recent knowledge explosion has even widened the gap. As Gewirtz has pointed out, "Freudian and Hullian approaches before World War II set the organism as being unresponsive and needing only biologically derived things, as food and clean diapers. Now, there has been a radical change to the view of the infant as active in interchange with his environment. Just as the caretaker promotes the child's growth by mediating stimuli that are valued by the child, the child can also mediate reinforcing stimuli. This can affect learning by the mother" (Gewirtz, 1968, p. 172). While this insight undoubtedly has implications for the manner in which the mother/infant immediate post-delivery care is provided, the way in which it may be most useful for the theories and practices of early childrearing are largely unknown.

One of the reasons for the rapidly increasing interest in infant development and mother/infant interactive behaviors is derived from research indications that one's adult behavior may be influenced, to a considerable degree, by one's early experiences. It is believed that, if the significant aspects of infant experience and behavior can be sharply identified and measured, it will be easier to comprehend and predict adult behavior.

A number of behavioral science disciplines show agreement over the pervasive and long-term effects of the infant's experiences, but there are differences as to the base from which the problem is approached. There are those who utilize a 'critical period' hypothesis, and others who are primarily concerned with the way a baby learns. Some have a psychoanalytic orientation which leads them to view infant-to-mother attachment and the attainment of object relations as major study material. Still others have a behavioristic base which prompts them to be most interested in operant and other conditioning methods. Regardless of the orientation, all agree on the importance of infancy.

The epigenetic development of the baby has been receiving increasing attention. The point of birth, rather than being a beginning, is only one sequence on a developmental continuum. Events having significance at any place along this continuum will affect all subsequent development. However, it is at the point of birth that the mother must begin to care for her infant consciously, and in ways that are in keeping with his needs for certain kinds and amounts of experiences as the time is appropriate for these. While a good deal of information about the nature of the young infant continues to accumulate, there seems to be a disproportionately small amount of direct observational data pertaining to the functioning of the new baby and his mother in relation to each other. If these experiences are, indeed, important -- as steps along the developmental continuum -- then it should be useful to learn exactly what are the beginning interactive behaviors among a variety of infants and their mothers.

It must be taken into consideration that, by the time a baby is born, a number of factors have already influenced his state of growth and development, and the behavior his mother will direct toward him. A significant example is the adverse effect of inadequate maternal nutrition on the unborn and the young infant (Pitkin et al., 1972). Brazleton and Robey (1965) have described the disadvantages of prenatal and perinatal drugs to the fetus. Maternal rubella is one of a number of infections that are known to be directly associated with congenital defects (Ober, Norton and Feemster, 1947). S. Wolff (1967) has reported some of the ways obstetrical complications contribute to the etiology of behavior problems in childhood. To some extent, even the mother's psychological reactions have governed what the infant received as a fetus, and may have imposed some injurious demands upon him (Knoblock, 1958; Downs, 1964). Furthermore, her behavior toward him will already have been shaped by her genetic and cultural background, her pregnancy experience, and by her own mothering as an infant (Newton, 1955; Pasamanick, Rogers and Lilienfeld, 1956; Pavenstedt, 1967). Thus, there are a considerable number of preconceptional and prenatal influences involved in shaping the interactional potential of infant and mother by the time of birth.

As research data accumulate from the studies of such investigators as Ainsworth and Bell (1969), Caudill and Weinstein (1969), Klaus et al. (1972), and Barnett et al. (1970), it becomes evident that the kinds of interactive experiences provided a mother and her infant from the earliest days after birth may have special importance. These researchers have described various sequences of maternal-caretaking and infant-attachment behaviors that suggest the occurrence of significant patterning -- of a developing and cumulative nature -- from the first postpartum hours. There is a need to ascertain that the experiences provided within the hospital foster, rather than hinder, the unity of the mother-infant couple in appropriate ways.

The cumulative evidence that maternal-infant interactive behaviors are affected by the experiences of early post-natal life, and that the behavior of each is influenced by that of the other, leads one to ask what significance the very first hours together might have for the mutual well-being of mother and baby at the time, and for the manner in which the mother's caretaking -- and the infant's attachment -- behaviors will develop. Guidance to a mother, relative to helping her understand her baby and to use this understanding effectively, may be a task of immediate priority -- particularly for hospital and public health nursing personnel. However, additional descriptive data about the formative processes of the mother-infant relationship is needed before it will be possible to state with certainty, the relative importance of their emergent interactions to the long-term quality of maternal caretaking skills, or to the healthy development of the baby.

Therefore, this study was designed to:

1. make direct observations of the behaviors of selected mother-infant pairs on their delivery day as a basis for examining the beginning sequences of their interactions and for identifying their needs as interdependent units during hospitalization.

2. obtain data which provide insights into the process by which the mother, as her infant's primary source of environmental input, influences his development.

CHAPTER II

REVIEW OF THE LITERATURE

In recent years there has been a great deal of attention focused on the significance of early experience for the development of animal and human infants. Since the mother provides much of this early experience, the way in which she behaves toward her baby, and his formation of an attachment to her, have generated increasing interest. In the main, mother-infant studies have been concerned with interactive behaviors three or more weeks after delivery. Yet, reports from such investigators as Klaus et al. (1972) and Barnett et al. (1970) have indicated that the immediate post-partum period may be an especially sensitive time for the mother-to-infant attachment formation of an adult woman. This seems to be dependent upon the amount of contact the newly delivered mother has with her baby -- and the nature of the responses received from him.

A number of investigators have described work suggesting that the neonatal infant is capable of learning, and that he is a competent individual in interaction with his environment when his behavior is understood and dealt with effectively (Fantz and Nevis, 1968; Bower, 1971; Wolff, P. H., 1967b). Lewis (1967a) found that the three-month-old infants he studied had already learned that they can expect their actions to have a pay-off. Caudill and Weinstein (1969) observed three- to four-month-old Japanese and American infants, and found significantly different behavior patterns which seemed to have emerged in respect to culturally different maternal behaviors.

The status of the research was summed up by Ainsworth and Bell (1969) as follows:

> Within the past decade or two research into the effects of early experience upon later personality development has shifted away from preoccupation with the fixation hypothesis towards an examination of mother-infant interaction. Impetus for this shift has come from several sources --from new developments in the study of animal behaviour, from Piagetian cognitive theory (by extrapolation), from developments within psychoanalytic theory itself, and also as a consequence of studies of the responses of infants and young children to mother-child separation and to deprivation of maternal care. The implication is still that there is continuity of development from infancy to later years and that patterns of reaction established in infancy may profoundly influence later development. There has, however, been a subtle shift from the hypothesis that an unalterable personality structure is fashioned through experience in the earliest years to the hypothesis that neonatal, neurophysiological, and behavioural structures are transformed through the infant's earliest transactions with his environment and bias his perceptions, and action patterns so that he responds to subsequent situations at least initially, in the light of the earlier experience. Although these inner structures are assumed to be more or less modifiable through experience, experience itself is held to be influenced by inner structure. It cannot therefore be assumed either that early structuring is the sole or major determiner of later outcomes or that its influence is so attenuated through later transformations as to be negligible. (p. 134)

Burns et al. (1972) have described the infant and mother as being in a system in which they interact adaptively, leading to a synchronization of infant rhythms (as sleeping, crying, eating) and stable caretaking routines. They consider this synchronization to be the critical adaptive task of the first two to three post-natal months. Pavenstedt and Sander (1962) in a work upon which the above study was based, found that the successful accomplishment of the issues involved in this first adaptation was highly correlated with the success of subsequent mother-infant adaptive tasks, in couples they observed over the infants' first eighteen months.

Goodrich (In Frank, 1968, p. 47) has also described these processes, from the point of view of the infant, as universal tasks facing every neonate and contributing significantly to his total growth - or failure to grow. He lists them as the establishments of stable and satisfying feeding and tactile interaction patterns with his mother, the establishment of a relatively stable sleeping pattern, and the psychophysiological maturation of his visual apparatus.

The above authors indicate that there is an epigenetic aspect to development. Any factor with a significant effect on early development inevitably affects all subsequent development. The approach does not seem incompatible with the ethological point of view as expressed by Bowlby (1969) and Ainsworth (1969) who explain reciprocal mother-infant behaviors leading to successful parenting and healthy infant development as being based in coordinated neuromuscular patterns. These are seen as being fixed motor patterns which are released in one of the partners by an appropriate innate stimulus from the other. Lorenz (1956); Hess (1958); and Tinbergen (1953) have provided detailed descriptions of these behaviors in animals. The extent to which they operate in human mother-infant couples has been open to speculation, although some investigators (Bowlby, 1969; Salk, 1969; Moss, 1967; Blauvelt, 1961) have cited specific newborn infant behaviors which they believe to be innate releasers of caretaking responses by the biological mother. How far human infants exhibit releasing stimuli to their mothers (for example, their touch and smell to trigger the let-down of milk - in turn, prompting the infants to nurse) is a question without an easy answer.

Since the mother and infant are apparently interacting in a system which is dependent upon reciprocal responses for the successful adaptation of one to the other, then both may be especially sensitive to the nature of their experiences in the immediate post-partum period. Klaus and his colleagues (1972) have demonstrated that this seems to be so for the small sample of mother-infant couples they studied. Mothers who were given extra time with their infants shortly after birth showed greater attentiveness to them and more confidence in their caretaking skills than mothers who were not permitted this extra time. In respect to the infant, Ribble (1943) described the more adequate stabilization of respirations when he was immediately held and helped to nurse. Such behaviors may have interactive as well as physiological values.

In view of the possible significance of immediate post-delivery interactive experiences for mother and infant, it should be useful to describe exactly what behaviors emerge when they are placed together for a period of hours. Is there a system of feed-backs from one to the other? In a variety of mother-infant pairs, what commonalities and differences exist in these earliest interactions?

Mammalian Studies of Mother-Newborn Infant Behaviors

Several animal species have been studied in an attempt to identify the variables that interfere with the development of maternal caretaking behaviors and to describe the effects of variations in caretaking on the development of the offspring. The study results generally suggest that there may be similarities in the way in which human maternal behavior develops and in the influence of different kinds of mothering on the baby.

A short separation of animal mother and newborn has been found to impair or eliminate maternal behavior in some animal species. Rosenblatt (1965) observed that rat mothers do not undergo the normal maternal behavior cycle when the litter is removed during parturition. Hersher, Moore and Richmond (1958) and Hersher, Richmond and Moore (1963) demonstrated that brief separation of newborn goats and sheep from their mothers resulted in a significant interference with the mothers' feeding and caring for the young in about 50 percent of their test animals. Klopfer (1971) found that goat females who were allowed a five minute contact with their own or with alien kids immediately after delivery accepted and cared for them. He hypothesized that there may be a special period at birth during which the mother is ready to acknowledge and nurture her young. If they are separated during this time, then deviant mothering behavior may result. Klopfer believes that oxytocin or some other hormone which is released while the mother is in labor may be the cause of the short period of receptivity to her young. Rosenblatt and Lehrman (1963) also identified a hormonal influence on maternal receptivity in rats. They demonstrated that the changes resulting in nest-building are related to thermoregulatory mechanisms and to the hormonal effects of being stimulated by contact with their offspring. While progress in nest-building is made before parturition, it stops unless the mother and her young have immediate contact after delivery.

Reduction in the sensory modes of contact available between an animal mother and infant may also impair maternal behavior. Harlow, Harlow and Hansen (1963) have shown that rhesus mothers who were allowed to see and hear their infants, but not touch them, rapidly decreased the time they spent viewing them after two weeks of the tactile deprivation. These investigators suggest that contact-clinging in monkeys may be the most important influence on the formation of the mother's bond to the infant, and on the infant's attachment to the mother.

A synchrony in the behavioral interaction between rat mothers and offspring has been described by Rosenblatt (1965). The initial post-delivery contacts are, apparently, dependent upon the behavioral changes that have occurred in the mother during pregnancy. These contacts, in turn, prompt other maternal behaviors. A pattern of interaction is set up, which continues until weaning. This sequential nature of the developing mother-offspring relationship has also been noted by Hersher, Richmond, Moore and Ulrich (1963). When there is interference with the sequence of steps in the development of normal relations, a variety of blocks may arise to produce abnormalities in maternal caretaking behaviors. These, in turn, lead to problems with the infants ranging from death to varying degrees of deviation in development.

The quality and quantity of sensory stimulation (particularly tactile), provided the infant by its mother, appears to be a major influence on the infant's normal development. Harlow (1958) placed baby rhesus monkeys with wire and cloth mother-substitutes in order to compare

---

the relative importance of nursing and contact-clinging to the infant. While the surrogate mothers were equivalent as the providers of milk, they were neither psychologically nor tactilely equivalent. The babies spent significantly more time with the softer cloth mothers when they were given a choice, and they sought the cloth mothers when subjected to strange or frightening situations. Harlow (1965) subsequently found that those monkeys who had been deprived of sensory stimulation from their own mothers, and permitted only limited association with other monkeys, failed to develop, mate and rear their young normally. The lack of the normal gratification of contact-clinging in infancy apparently interfered with the ability of the females to show normal contact relationships with their own infants. Maternal grooming and infant contact behaviors appear to be a necessary means of providing tactile input for the young infant. Such behaviors intensify the forming bond with the mother, and lay the foundation for the infant's mature adult behavior. He concluded that (1) contact-clinging is necessary to the formation of an infant's love for its mother; (2) the mother's natural caretaking behaviors provide her infant with experiences that are essential to its normal behavior as an adult; (3) neurophysiological and biochemical variables underlie the development of affection and love.

Levine (1969, 1960, 1957, 1956) has studied the neurophysiological and biochemical variables in the rat mother-offspring relationship extensively. He reports that varying applications of stress, such as handling or electric shock, have an immediate impact on the infant's physiological responses and on the process of its social interaction with its mother. Handled rat infants show more adaptive responses to stress than non-handled infants. They also show differences in general development, as evidenced by more rapid weight gain and earlier achievement of motor coordination. Even minimal handling or other stress in early infancy appears to have profound effects upon subsequent performance of the developing infant. The central nervous system can be affected in such a way as to produce a markedly different pattern of neuro-endocrine activity. Levine has also shown that brain neurochemistry, electroencephalographic activity, the response to pathogens, the rates of survival to severe stress, and the response to brain lesions, can all be modified as a result of varying amounts and kinds of stimulation. He points out that the major effects observed as a consequence of infant stimulation seem to occur in situations in which emotional factors are of major importance. Cognitive functioning doesn't seem to be affected, but the stimulation does alter some of the infant's characteristics which are related to emotional reactivity. It also alters the hormonal and behavioral characteristics of the mother, in response to her changed relationship. These effects are transmitted back to the offspring. Temperature is also a factor. Cooled rat babies call more, and this influences the mother's behavior toward them.

In summary, the mammalian studies provide the following insights:

1. Separation of the young from their mother at birth causes deviant maternal behavior in some species.

2. Primate mothers who are restricted from tactile contact with their young show deviant mothering behavior which is, possibly, related to the lack of sensory input received from the infants.

3. When the normal sequence of childbirth and infant-rearing events is interrupted, some species of animal mothers will either abandon their young or fail to mother them appropriately.

4. When the mother's behavior is deviant, the amount of sensory stimulation to the offspring is either insufficient or lacking.

5. Variations in the quality and quantity of tactile stimulation produce variations in the baby's immediate physiological responses and in its capacity for normal development.

6. Suckling at the breast, apparently, is not as important to the infant as is the opportunity for close contact with the mother.

7. The mother's behavior influences the infant's

responses. The infant's behavior influences the mother's responses.

Studies of Human Mother-Infant Behaviors

Bettelheim (1968) who has long been concerned over the etiology of behavior problems in autistic children, feels that appropriate mothering is of critical importance during the first six months of a baby's life. He stressed the infant's need for responses from his environment that encourage his spontaneous moves toward the world. These, initially, are within the give and take relationship with his mother. Bettelheim feels that this relationship is the prototype for all subsequent human and environmental relationships. Even in newborns, uncomfortable feeding situations that cause an infant to struggle, can cause unwanted response patterns to become established, if they are allowed to continue for a few days. As he sees it, the natural language of the baby is his cry, smile, or bodily motion such as turning his head toward his mother. When such behaviors are understood and responded to affirmatively, the pattern for future human communication is set in a positive way. Just as the imprinting phenomena in the young of lower animals fixes lifelong characteristics, so do these early response patternings fix long-term characteristics in the young human infant.

The studies of white, middle-class mother-infant couples being conducted by Ainsworth and Bell shed light on this point of view. In a 1967 investigation of twenty-six Baltimore families they made home observations of mother/three-month-old infant pairs as they interacted in the feeding situation. Correlations of the feeding patterns with (1) the baby's crying pattern, (2) the mother's attitude and caretaking practices, and (3) the baby's behavior when, at one year of age, he was placed in a strange situation, revealed the following findings:

> In general, these mothers who could see things from the baby's point of view tended to adopt infant-care practices which led to harmonious interaction not only in feeding but generally . . . . babies whose behavior, social and otherwise, had consistently gratifying or interesting feedback tended to cry less, to learn modes of communication other than hard expressive crying, and to gain more frustration tolerance and more regular and predictable rhythms than babies whose behavior made little or no difference in determining what happened to them. (Ainsworth and Bell, 1969, p. 150.)

The way in which the relationship between mother and baby develops may also influence his cognitive growth. Bell (1970) observed thirty-three mothers with eight-month-old babies, following them for a period of months. She found that a relationship seems to exist between the attachment process and the development of object concept. Babies, she feels, tend to be more advanced in the concept of person permanence than in the concept of object permanence. Differences in the rate of development of person permanence are apparently related to the quality of the infant's attachment to his mother. Differences in the rate of development of person permanence can, in turn, affect the rate of development of object permanence.

This is important because the infant's attainment of object permanence is a necessary foundation for his cognitive growth.

The immediate post-partum period may be an especially sensitive time for the development of mother-to-infant attachment. Klaus, Jerauld, Kreger, McAlpine, Steff, and Kennell (1972), questioning whether or not present hospital practices may affect later maternal behavior, placed twenty-eight primiparous mothers of healthy full-term infants in one of two study groups. The control group mothers were permitted the customary contact with their infants. This consisted of an immediate brief glimpse of the baby at delivery, brief contact at six to twelve hours after the birth, and routine four-hourly feeding sessions thereafter. The mothers in the experimental group were given contact with their infants for one hour within the first three hours after delivery, and also, five extra hours of contact on each of the three following days. After one month, the mothers and infants returned to the hospital and observations of maternal performance were recorded while their infants were receiving routine physical examinations. The sixteen extra hours of contact given to the experimental mothers in the first days after delivery apparently had an effect that persisted for this month. These mothers had significantly higher 'fondling' and 'en face' scores. It was concluded that there may be a special attachment period in the human mother somewhat similar to that described in animals. The authors recognize, however, that the "early presentation of a baby shortly after birth is possibly taken by his mother as a special privilege or recognition that, in itself, may have altered her behavior. In either case, it does effect behavior" (Klaus et al., 1972, p. 463).

Klaus, Kennell, Plumb and Zuehlke (1970) filmed the behavior of twelve mothers during their first contact with their normal, full-term babies, and nine mothers during their first three tactile contacts with their premature infants. An orderly progression of tactile contact was observed in all of the mothers. This began with fingertip touching of the babies' extremities, followed by palming of their trunks and then, encompassing arm movements to promote close contact. It took the mothers of the premature infants longer to achieve close contact with their babies. This seems understandable, since the frailty of the prematures, the use of incubators instead of cribs, and the sense of restrictedness and protection that is associated with premature nurseries could all have been interferences that affected the mothers' feelings of freedom to handle their infants as they wished. All of the study mothers showed an intense interest in being able to look into their babies' open eyes at first contact. Those who were able to do so indicated that it made them feel closer to their babies. Other investigators (Moss, 1977; Robson, 1968) have suggested that this 'vis-a-vis' behavior is an infant stimulus that releases responsive maternal feeling.

The progressive handling pattern of a human mother with her newborn has also been described by Rubin (1963) and Morris (1968) who feel that this is a claiming-identification procedure which is dependent for its successful achievement upon the nature of the mother's anticipated relationship with her baby during pregnancy, and upon her perception of her labor as a satisfying experience. Rubin also likens it to the steps that any individual takes, in relating to a stranger. These proceed from an arm's length approach to hands touching, with close contact coming last. Klaus et al., in the 1970 study cited above, likened these characteristic human movements to the species-specific grooming and investigating patterns that may be observed between mother and newborn in many other mammals. Levine (1969) has observed that these species-specific patterns of mutuality between mother and young serve the function of enabling the infants to develop into species-characteristic adults.

Further evidence that the immediate post-partum period may be an especially sensitive time for the development of mother-to-infant attachment derives from an ongoing study of mother/premature infant couples (Barnett, Leiderman, Grobstein and Klaus, 1970; Seashore, Leifer, Barnett and Leiderman, 1971; Leifer, Liederman, Barnett and Williams, 1972). Using an experimental group of thirteen mothers and a control group of sixteen mothers - all with premature infants - they are attempting to identify the effects of interactional deprivation on the mother. The experimental mothers were allowed to handle and care for their infants whenever they wished, while the control mothers were restricted to the customary occasional viewing of their babies. Their long-term effort aims at delineating the differences in commitment, feelings of competence, and attentive behavior in the two differentially treated groups of mothers, and to relate their behavior to the motor and mental development of the infants. Thus far, the experimental mothers do seem to show greater confidence in their mothering skills and greater attentiveness to their babies. The authors are questioning whether the mothers deprived of early contact will provide less stimulation to their babies later on, because an attachment was not developed when they were most sensitized. They also hypothesize that physiologically, contact of the mother with her newborn infant may be an important stimulus to (undetermined) hormonal states, while psychologically, contact may provide important reinforcement and learning experiences.

Stern (1973) has linked low birthweight to subsequent child abuse in a retrospective study of twelve prematures. The prolonged hospitalization that is sometimes necessary to overcome the physical problems of prematurity may necessitate an unnatural separation of mother and infant at a critical stage. He found that "over a nine year period, more than 23% of victims had been small, low-weight infants at birth; hospital stay in the newborn period averaged 41.4 days" (Stern, 1973, p. 118).

In recent years, the effects of stimulation on the human infant has received increasing attention. Wachs and Cucinotta (1972), Freedman, Boverman and Freedman (1966), and Hasselmeyer (1961) have demonstrated that the human newborn is, at least temporarily, affected by the nature and amount of stimulation he receives in his first post-natal days. Wachs and Cucinotta (1972) provided thirteen normal newborns with 140 minutes of supplementary handling, audio-visual stimulation and rocking, daily, for the first three days after birth. These infants were also placed on a thirty-day regime of extra maternal handling with an emphasis on contingency of feedback after they went home. At four days of age, these stimulated babies showed better conditioned head-turning than a group of control infants. At thirty days, their visual attentiveness was greater. However, by ten months of age, a comparison of the two groups revealed no significant differences in scores on the Infant Psychological Development Scale (a Piaget-based measurement for object-permanence, vocal imitation and foresight). These authors suggest that permanence of effects may not have been achieved in their study, and in others pursuing the same question, because (1) the necessary amount of critical stimulation may not have been reached, or (2) there was lack of retention due to the unstable memory traces of young infants. Another possible explanation might be that the 'hospital stimulating' was not done by the infants' own mothers in these studies. Other caretakers, mechanical rockers, taped voices - and the like - have been used. If there is, indeed, an especially sensitive period for the developing mother-infant relationship in the immediate post-partum days, then the mother's stimulating of her own infant might be found to produce more lasting advantages.

Another group of studies have demonstrated the infant's role in determining the kind of caretaking received. The studies of Aldrich, Sung and Knop (1945), Aldrich, Norval, Knop and Venegas (1946), and Burns, Sander, Stechler and Julia (1972) describe the newborn infant as capable of communicating his distress when tended by multiple caretakers who ignore his individualized needs for food, sleep and general care. These authors also see the newborn as capable of displaying satisfaction when his care meets his needs for individualized attention promptly.

Burns et al., (1972) looked at infant-caretaker interaction from the point of view of the development of regulatory processes leading to mutually adaptive behaviors. They conceived of the mother and infant as interacting in an adaptive process that leads to eventual synchronous organization. The earliest interactive task, as they define it, is that of regulating intrinsic infant rhythms such as sleeping/waking, eating/eliminating, toward the goal of stabilizing the caretaking routine. Failure to achieve this adaptation will affect the ongoing interaction. They exposed normal neonates to different caretaking environments to find out how much difference it made to a baby when he was treated rigidly and indifferently, and when he was treated sensitively and in accordance with his individual needs. One group of babies were subjected to a rigid routine for their first ten post-natal days, and then changed to a more individualized routine. They showed evidence of less distress (crying, fussing, turning away, etc. during feeding) when the rigid schedule was changed to the more individualized one. Another group of infants received the individualized treatment first. When they were switched to the rigid schedule at ten days of age, they showed increased distress. On a whole, the authors found that babies do react to the kind of caretaking they receive, and that they communicate less distress when their care and feeding is contingent upon their beginning attempts to communicate their needs.

In previously cited studies (Sander, 1962; Pavenstedt and Sander, 1962) Sander listed a sequence of adaptive issues to be accomplished by the mother-infant couple during the first two years. He described these as being related epigenetically, i.e., the success of one determining the base on which the next will rest. The first issue is the accomplishment of regularity in basic life processes such as eating and sleeping, by the infant, with a corresponding and comfortable stabilization of caretaking routines by the mother. "The successful completion of an initial phase of adaptation readies the infant and mother for a next level of adaptation in the progressive development of social responsiveness and effective communication" (Burns et al., 1972, p. 428). It was found by Pavenstedt and Sander (1962) that the successful accomplishment of the first adaptive issue was highly correlated with successful negotiation of succeeding issues over the first eighteen months of an infant's life. This finding suggests that the way in which the initial task of regulating infant functions and stabilizing maternal caretaking is carried out, is significant for further infant development. Burns et al., (1972) believe that the data from their study (cited above) "point up the importance of the earliest days of life in the establishment of expectations for key environmental features, and in influencing the sensitivity of a 'distress signalling system' in its role as a regulating link in the infant-caretaker interaction" (p. 436).

Blauvelt (1961) watched infants to find out their special capacities for responses in the environment provided by their mothers. She hypothesized that the human mother and her baby possess the capacity for mutual orientation during the post-partum period. It was predicted and substantiated that the infant's movement would differ when tactile stimulation was applied near his lips or near his ear. She found that the neonates so stimulated would turn their faces toward their mothers' faces when this touch moved from their ears to their lips. Specificity of stimulation in certain parts of the infant's body seems essential to his capacity to coordinate with his mother's movements. Head movements in response to touch on the cheek and lips form the most mature of the newborn's responses. Blauvelt sees these behaviors as having some similarity to the contact-clinging capacities of primate newborns as the means of sustained orientation to their mothers. Possibly, the primate mother's post-partum physiological state is associated with her tolerance of her newborn, specific stimulation by him being the overt action by which his mother supports him. She suggests the existence of a similar process in humans. Perhaps the human infant's head-turning and orienting to his mother's face is a releaser for her response behavior.

Bowlby (1969) describes human infant sucking, clinging, smiling and crying as activities that may release the behavior which functions as maternal care. This is in agreement with Lorenz' point of view that there are characteristic responses of parent and young animals which mediate the social relationship between them. These are not purposive, but are physiologically potentiated and represent genetic adaptations" (In Foss, 1961, p. 24).

It is becoming increasingly clear that newborns have special competencies, and that when these are understood and responded to appropriately, the chances of an infant for healthy development will be considerably improved. Kessen (1961) has demonstrated that newborns can discriminate sound at six days of age. Fantz (1963) has described the preference of babies under two days of age for certain stimuli - especially, the human face. Caudill and Weinstein (1969) have shown that, within a few weeks, the new baby will have picked up certain behavior patterns because of his association with his primary caretaker. The newborn is neither incapable of participating in the events that will shape his further development nor unable to communicate his willingness to cooperate in directing his best care. It remains for his caretakers to understand him, and to use their understanding effectively.

In summary, the studies of human mother-newborn interactions indicate that:

1. The pattern for the infant's future communication ability may be partly influenced by the sensitivity and appropriateness of his caretaker's responses to his signals.

2. The quality of the infant's attachment to his mother is apparently dependent upon the quality of their interaction from the point of birth, and influences his cognitive development.

3. Contact between the mother and infant immediately after birth may influence the development of her maternal behavior.

3. Human, as well as animal mothers, appear to have patterned species-specific behaviors in relation to their newborns which may be necessary to the optimal development of their interaction.

5. There is apparently an epigenetic aspect to the development of the mother-infant relationship, certain interactive tasks being the pre-requisites for the successful completion of succeeding tasks.

6. The newborn infant has the capacities for interchange with his environment and for some control over it.

7. The quality and quantity of stimulation provided a newborn infant determines, to some extent, his physiological and mental responses to his environment.

Literature Review Pertaining to Methodology

In the above review, attention was paid primarily to findings and not to methodology. Most of the studies used observation in some organized fashion, but there was no single instrument designed to fit the needs of this study. Therefore, the time-sampling technique used by Rheingold (1960) was modified to fit the hospital ward situation, and mothers with very young infants.

The variables placed on the observation schedule were suggested by the studies of Moss (1967), Rheingold (1960), Lewis (1972b), Caudill and Weinstein (1969) as well as by the literature reviewed above and as an outcome of the author's own maternity nursing experience.

Moss (1967) for example, found that the baby's cry was a strong determinant of the mother's responsiveness, while Lewis (1972b) reported that there were differences in maternal treatment of boy and girl infants even when the infant condition was the same across the sexes. Therefore, the observation schedule included 'infant cry' as well as variables descriptive of the infant's sleep/wake state, and infant sex as an independent variable, so that there might be clarification of this difference for this sample.

Rubin (1963) and Klaus et al., (1970) both described a pattern of maternal handling during the mother's early contacts with her new baby. Therefore, maternal behavioral variables describing distal and proximal handling were included so that it would be possible to determine whether, for this sample, such a pattern existed.

Race was included as an independent variable. Cahill (1961) found that socio-economic status, rather than ethnic group, accounted for differences in maternal behavior. In the population studied in this present

---

paper, all participants were hospital-coded as medically indigent. It was of interest to see whether, with the socio-economic variable controlled, race would make a difference in a mother's approach to her newborn infant - or in the infant's general behavior.

Maternal parity was also included since it is a possible reason for differences in maternal responsiveness. Klaus et al., (1970) found no differences between primiparas and multiparas in their attempts to achieve visual contact with their infants. Thoman et al., (1970) noted that primiparas were more attentive to their infants but had more difficulty quieting them. Bernal (1972) observed that multiparas responded to their infants' signals more quickly. While these specific observations were not a focus of this study, the author was interested in knowing whether or not parity was a significant factor in determining maternal interactive behavior.

Burns and his colleagues (1972) have noted that the cues used by infants and their mothers to regulate interactional behaviors have not been the subject of much study, and are not well known. Biologic rhythms of the infant such as sleeping-waking, hunger-elimination appear to be independent in the newborn, and become synchronized into regulated behavior during early development. The authors suggest that there is a need for studies of the specific relation of each major function of the infant to the mother-infant interaction. The earliest experiences may be significant influences on the behavior and communication within the interaction, particularly in respect to the baby's establishment of expectations for response to his signalling for attention and for the mother's development of sensitivity to these. Burns et al., (1972) indicate that the specific cues by means of which a baby identifies and responds to his caretaking environment are auditory, visual, kinesthetic and tactile perceptions, and that timing, pacing and approach-withdrawal behaviors of the mother affect their interaction. Therefore, in developing the list of variables for this study, an attempt was made to define these maternal behaviors, as well as the variety of responses an infant might be expected to make.

As the literature indicates, numerous other factors influence the behaviors being observed. Some of these which influenced this research design are:

1. Previous handling of the baby by his mother. Barnett et al., (1970), Klaus et al., (1970) and Leifer et al., (1972) all suggest that the mother's handling of her baby post-partum may influence the nature of her behavior toward him.

2. The mother's perception of her rest as adequate or inadequate, during the 24 hours prior to data collection. It is known that anticipation of labor, prodromal and false labor, the actual birth experience, and the

excitement phase after delivery, can be physically and emotionally draining. There may be a period of more than 24 hours during which the mother rests poorly or not at all.

3. Mother's perception of her labor as a good, indifferent or bad experience: Rubin (1961) describes a mother's need to clarify and cope with her perception of the labor experience before being able to move into a whole-hearted experience of interacting with her baby.

4. Baby's age in hours: it was probable that the amount of handling a baby had received in the nursery would be greater for the older infants. This might account for some differences in their behavior.

The method of establishing observer reliability was suggested by Caudill and Weinstein (1969) in their study of maternal care and infant behavior in Japan and America.

CHAPTER III

PROCEDURE AND TREATMENT OF THE DATA

The purpose of this study was to describe mother and infant behaviors, especially interactive behaviors, during a six hour observation period on the day of delivery. The objectives were:

1. To obtain a detailed description of maternal and infant behaviors, in accordance with a predetermined list of variables.

2. To identify the relationships among these variables, particularly in respect to the identification of the initiating and responding partners, and the nature of the interaction.

3. To discover whether there are differences in mother and infant behaviors related to maternal parity, race, infant sex, previous maternal handling of the baby, maternal rest adequacy, baby age at the onset of data collection and mother's perception of her labor experience.

The hospital is not a natural setting for childbirth, but it is the customary one in America. It was expected that events which are part of the normal ward routine would contribute to variation in the data collected in this study. Staff members were urged to proceed with the care of the study mothers in accordance with their normal functions. However, the main sources of variation in the data to be collected were expected to be rooted in biological, physiological and socio-cultural circumstances. Therefore, the questions submitted by this author were:

1. What are the frequencies of maternal and infant behaviors during the observation period?

2. What are the most frequent ways for a mother to initiate an interaction with her baby? What are her most frequent responses to his cues? What are the ranges?

3. What are the most frequent ways for a baby to initiate interaction? What are his most frequent responses to intervention? What are the ranges?

4. Do mothers follow a predictable pattern of handling their new infants?

5. What percent of the time do babies use signalling behaviors without being responded to?

6. Can differences in any of the above be related to the following independent variables?

    a. Race
    b. Parity
    c. Infant sex
    d. Previous maternal handling
    e. Maternal rest adequacy
    f. Baby's age at onset of data collection
    g. Mother's perception of her labor

Preliminary Considerations

Before beginning this study, the investigator met with the nursing staff of the maternity unit at Shands Teaching Hospital, and with the faculties of nursing programs using the unit as a facility for student experiences. The purpose was to describe the study and procedure to be followed. The physician staff responsible for the care of mothers and infants was also contacted in order to obtain clearance for the changes in routine that would be involved and to obtain their cooperation. The Health Center Committee for the Protection of Human Subjects received a copy of the proposal, a description of the procedure, and the consent form to be used. A copy of this form appears in Appendix A. These were approved on May 30, 1973, and the Medical Procedure #36-73 assigned to the project.

The Sample

The subjects were twenty-six mother/infant couples selected from the patient population on the family-centered maternity unit at Shands Teaching Hospital between June 12 and August 2, 1973. The factors determining the selection of this group were:

Mothers

1. Absence of any obstetric or other health complication that would necessitate other than routine labor and postpartum care.

2. Clinic, as opposed to private, patients.

3. Agreeable by written consent to participation of self and baby in the study.

4. Sixteen years of age or over.

5. Decision to bottle-feed baby.

Babies

1. Birth weight of five pounds or over.

2. Full-term, according to the mother's estimated date of confinement.

3. Apgar Score of 7 or over, one minute after birth.

4. Absence of birth, or post-natal complications that would require additional handling or treatment in the nursery.

The mother/infant couple approached for participation in the study each day was the couple most recently delivered at the time data collection began. Mothers under sixteen years of age were excluded because it was felt that their probable immaturity, and reactions to the childbirth experience, might not provide data generalizable to the specified population. The mothers were all clinic patients, and were bottle-feeding their babies. Estimates based upon a six-month review of the delivery records suggested that there would be too few private mothers and too few breast-feeding clinic mothers to justify the anticipation of large enough sub-groups.

Description of the Population

This population is comprised of maternity patients who live in north-central Florida. They receive prenatal care and a six-week post-partum physical examination in the clinic of Shands Hospital or in one of several satellite clinics located in, or near to, their own communities. These women are supervised prenatally and delivered by the resident physician staff at Shands Hospital, after which they are cared for in the family-centered maternity wing until noon of their third post-partum day. A description of the Family-centered Maternity Unit appears in Appendix B. Since the day of delivery is counted as the first post-partum day in this hospital, the time range of stay is 36 to 60 hours. Table 1 describes some relevant characteristics of this population, based on the delivery record figures for the period from July, 1972, to January, 1973.

The Selection of Mother-Infant Couples

Twenty-six normal mother-infant couples who were eighteen hours or less post-delivery, at the time data collection was begun, participated in this study. No mothers refused to participate. Table 2 summarizes the characteristics of the study population by infant sex, parity, race, previous maternal handling of infant, mothers' perceptions of the labor experience, and sleep adequacy and infant age. This table is based on Table 36: Summary of Characteristics Used as Independent Variables for Individual Subject Pairs in Study Population, which appears in Appendix C. At the time of the

TABLE 1

Characteristics about Population Based on Delivery Records: July, 1972, to January, 1973, and Comparison with Study Population*

Characteristics	Population (N= > 1000) %	Sample (N=26) %
Age Range		
12-19	42.0%	46.0%
20-35	58.0	54.0
Parity		
Primiparas	58.0	31.0
Multiparas	42.0	69.0
Race		
White	52.0	54.0
Black	48.0	46.0
Infant Sex		
Male	46.0	38.0
Female	54.0	62.0
Type of Care		
Clinic	93.0	*100.0
Private	7.0	0.0
Feeding Method		
Bottle	78.0	*100.0
Breast	22.0	0.0

*The study stipulated that the subjects be clinic patients who were bottle-feeding their babies.

TABLE 2

Summary of Characteristics of Study Population Divided According to Independent Variables

	Race				Parity				Infant Sex			
	Black		White		Primipara		Multipara		Boy		Girl	
Characteristics	N	%	N	%	N	%	N	%	N	%	N	%
Handled												
Had handled	1	4.0%	4	15.0%	1	4.0%	4	15.0%	4	15.0%	1	4.0%
Had not handled	11	42.0	10	38.0	7	27.0	14	54.0	6	23.0	15	58.0
Infant Age at onset of data collection												
1 - 6 hours	5	19.0	2	8.0	1	4.0	6	23.0	4	15.0	3	12.0
7 - 12 hours	4	15.0	6	23.0	1	4.0	9	35.0	4	15.0	6	23.0
13 - 18 hours	3	12.0	6	23.0	6	23.0	3	12.0	2	8.0	7	27.0
Mother's perception of labor												
Good	1	4.0	2	8.0	0	0.0	3	12.0	2	8.0	1	4.0
Indifferent	8	31.0	3	12.0	5	19.0	6	23.0	4	15.0	7	27.0
Bad	3	12.0	9	35.0	3	12.0	9	35.0	4	15.0	8	31.0
Sleep adequacy as perceived by mother												
Adequate	10	38.0	6	23.0	6	23.0	10	38.0	5	19.0	11	42.0
Not adequate	2	8.0	8	31.0	2	8.0	8	31.0	5	19.0	5	19.0

initial contact, immediately prior to the beginning of the data collection, the study was explained. The mother was told that we were interested in watching the behavior of newborn infants and would like to observe her baby while he was in the room with her. She was encouraged to carry on her activities as she would if the baby were not being observed. We suggested that she could handle the baby, sleep, leave her unit - that her activities would not interfere with our observations. The mothers were very cooperative and showed considerable interest in the purpose of the study. The observers wore street clothes covered by the required protective gowns during the observation periods. They referred to themselves as 'researchers' instead of 'nurses,' feeling that the mothers' behaviors toward their babies would be less biased if it were not known that a nurse was present. It was stressed that the focus of the study was upon the behavior of the baby, and not directly on the behavior of the mother. Staff members were asked to carry on with their normal activities in respect to the couples being observed.

Basic Pertinent Data

Certain information was recorded for each couple which described their socio-economic status, presence of any obstetrical or infant care problems, the course of labor and the mother's verbalized reaction to it - the present condition of mother and baby, the circumstances under which the mother had previously seen her baby, and the baby's age at the beginning of the observation session. The following independent variables were specifically taken into consideration:

1. Previous handling of the baby: all of the study mothers had seen their babies, usually right after birth, and a few had had opportunity to handle them. While it was not certain whether the customary brief period of contact at delivery would be an important differential, it was of interest to direct the study in such a way that would shed more light on the matter. Therefore, the population was divided into (1) those who had handled and (2) those who had not handled their infants prior to the beginning of the data collection.

2. Baby's age in hours: it was not known whether the older babies would be affected in any way by a longer period of caretaking in the nursery, or whether the longer time for stabilization following birth would be a factor. In order to account for these possibilities, the population was divided by the baby's age in hours as follows: 0-6 hours, 7-12 hours, 13-18 hours.

3. The degree of maternal fatigue: since this could possibly modify a mother's interest in, and attentiveness to, her baby, her perception of her rest and sleep as being adequate or inadequate during the 24 hours prior to the collection of data was recorded.

4. The mother's perception of her labor experience:

it was of interest to this author, to discover whether - for this sample - there would be observable differences among the mothers which might be attributable to their perceptions of their labor experience. Therefore, the subjects were divided according to their verbalized accounts of the labor experience as 'good,' 'neither good nor bad,' or 'bad.' The form used for recording this basic data appears in Appendix D.

The Observation Instrument

In making the observations, a time-sampling technique originally developed by Rheingold (1960) was used, with modifications for this study. One observation of exactly ten seconds was made twice during each minute, followed by a period of twenty seconds for recording what had been observed in terms of a set of predetermined variables, describing the behaviors of mother and baby. The observation sheet listed numbers corresponding to the variables down the left side. A sliding frame which listed the numbers and variables was designed so that the observer's eyes would not have to travel back and forth from the edge of the page to line up observation recordings with the appropriate variables. A tape recorded timer was used to notify the observer when to 'look' and when to 'record.' A picture of the sliding frame, a copy of the coding sheet, and a description of the tool development and use are in Appendix E.

Two observations were made each minute. The observation sheet covered a period of ten minutes. Upon completion of each sheet, the observer had a five-minute period during which she could clarify data and write descriptive notes about the behavior just observed. Each observation session was divided into a three-hour period in the morning and a three-hour period in the afternoon. There were 24 sheets, or 480 observations, for each couple.

Selection and Definition of the Dependent Variables

There were 28 infant and 26 maternal variables proposed originally. A detailed definition for each of these variables was established prior to the collection of the data. During the time that observer reliability was being established, it was found that some of these variables could be deleted or combined with others without distorting the fine detail of description desired. The final listing included 25 maternal and 27 infant variables. These were grouped under four headings: (1) Where was the mother? (2) Where was the baby? (3) What was the mother doing? (4) What was the baby doing? Shown below is the list of these variables and their definitions in its final form. A copy of the original list appears in Appendix F.

FINAL LIST OF DEPENDENT VARIABLES

Maternal Behaviors	Definition
1. Lying on bed	Lying flat, or with head of bed raised.
2. Sitting on bed	Sitting with feet over the side

	of bed; sitting tailor fashion - unsupported by mattress, pillows.
3. Sitting in chair	Self explanatory.
4. Standing	Standing in or near unit.
5. Asleep, dozing, or distracted.	Attention not on baby.
6. Changes baby's position	As turning baby over in crib, picking him up, changing him from arms to lap.
7. Hugs, kisses baby	Self explanatory.
8. Inspects baby	As counting fingers, examining ears, noticing such things as lanuge hair, eye color.
9. Palms baby	Handles baby with palms of hands.
10. Encradles baby	Holds baby with arms enfolding him.
11. Finger caressing	Uses fingers to touch, stroke, pat.
12. Attempts eye contact	Positions self so both mother's and baby's eyes are alighed. 'En face.'
13. Baby on shoulder	Self explanatory.
14. Baby by side in the bed	Self explanatory.
15. Rocks, bounces, shakes baby	Self explanatory.
16. Pats baby	Self explanatory.
17. Imitates baby	Copies baby's sounds or movements.
18. Looks at	Self explanatory.
19. Smiles at	Self explanatory.
20. Feeds	Attempts to feed, regardless of whether baby is actually taking milk.
21. Cares for	Diapering, cleaning face, rearranging baby's clothing, blanket.

22. Shakes crib	Self explanatory.
23. Talks to baby	Includes crooning, shushing and like sounds.
24. Talks about baby	Self explanatory.
25. Gets help with baby	Includes asking questions about baby.

Infant Behaviors	Definition
1. In crib	Self explanatory.
2. In mother's bed	Lying on bed. Does not include being held in mother's arms while she is on the bed.
3. In mother's arms	Mother's arms enfolding baby.
4. In mother's lap	Baby resting in mother's lap.
5. Asleep, dozing	Ostensibly asleep or almost so.
6. Awake	Self explanatory.
7. Smacks lips	Makes a sound, along with mouthing movements.
8. Mouths, roots, grimaces	Self explanatory.
9. Moving	Any movement - arms, legs, trunk, head. Does not include facial movements involved in mouthing, sucking.
10. Tremor, shudder	Involuntary starts, shudders, quivers - as opposed to gross movements.
11. Cries	Active bawling.
12. Fusses	Fretting.
13. Yawns	Self explanatory.
14. Sucks	As on fist, pacifier. Some object in mouth, as opposed to mouthing movements without object in mouth.
15. Hiccoughs	Self explanatory.

16. Sneezes	Self explanatory.
17. Burps	Self explanatory.
18. Spits	Attempts at, or actual spitting of mucus, milk.
19. Grunts, sighs	Self explanatory.
20. Eyes open	Self explanatory.
21. Blinks	Multiple, successive eye blinkings, as when baby is waking up, in a bright light.
22. Eyes shut	Self explanatory.
23. Eyes on mother's face	Open eyes fixed on mother's face.
24. Turns head to mother's face	The act of turning his head. Not to be marked when the baby is inadvertently positioned so that his face happens to be facing his mother's.
25. Alert feeding	Sucking actively, even though eyes are closed.
26. Disinterested feeding	Mouthing nipple, off and on sleeping, letting nipple stay in mouth without much sucking.
27. Avoids feeding	Actively pushes nipple out of mouth, turns head away, cries.

The Establishment of Observer Reliability

During a pilot study, the author trained two maternity nursing graduate students in the method to be used in selecting study subjects and recording the data. After these observers had read the proposal for the study, the variables were discussed and some joint observations made. The criteria for observer reliability was established as follows:

1. Eighty-five percent agreement between the author

and observers for the total observations during the test period and for the individual items.

2. Identification of significant items with low reliability; redefinition or clarification, and additional practice to bring them to the criterion level.

3. Combination or deletion of low reliability items that were not considered significant enough to warrant the additional practice that would be necessary to reach the 85 percent criterion level.

In making up the final list, the following maternal variables were combined: 'dozing/asleep' and 'attention distracted from baby.' Also, 'rocking, bouncing and shaking' of the baby. It was found necessary to add 'shake' to this category of maternal kinesthetic behavior because, in the testing period, it emerged as a common behavior.

Two more variables, 'gets help with baby,' and 'places baby on shoulder' were added because of the frequency with which they occurred during the preliminary testing.

In the beginning practice sessions the observers had difficulty in reaching agreement on the observations of 'examining (inspecting),' 'finger-caressing,' 'handling with palms of hands,' and 'encradling,' the baby. Since these maternal behaviors were felt to be potentially significant to the outcome of the study, they were concentrated upon during additional practice sessions until the author and observers reached the criterion level of agreement. Additional practice was also necessary before an 85 percent level of agreement was reached on the infant variables of 'sighs/grunts,' 'gross body movement,' 'tremor/shudder.' The infant variables of 'mouths' and 'grimaces' were combined, since they consistently occurred together. 'Looks at,' 'blinks,' 'eyes open' and 'eyes shut' were variables with consistently low reliability. This was possibly true because the differences in position of the observers did not permit them all to observe from the same vantage point. The observer reliability figures are shown in Tables 3, 4, 5.

Agreement between the author and observers as to the presence (yes) or absence (no) of a behavior was classified within four cells.

a. yes/yes
c. no/yes
b. yes/no
d. no/no

Percent agreement was computed as the ratio of (a) to (a) plus (b) plus (c). The use of agreement on the absence of a behavior (d) was avoided, since it was not felt that such utilization would contribute to the desired description.

An exact check was used. In an exact check, the author and observer(s) must have agreed about the presence of a behavior during the same unit of observation. The direction for this method of reliability testing was suggested by Caudill and Weinstein (1969) in their study of maternal care and infant behavior in Japan and America.

TABLE 3

Percent of Agreement Between Author and Observers on Observations of Six Cases: Test #1

Case	Observers	Minutes of Observation	Number of Observations	Overall Percent of Agreement
A	Author/Observer #1	7	14	95
B	Author/Observer #2	8	16	92
C	Author/Observer #1	37	74	92
	Observer #2			94
D	Author/Observer #1	32	64	84
	Observer #2			85
E	Author/Observer #1	64	128	87
	Author/Observer #2			91
	Observer #1/Observer #2			86
F	Author/Observer #1	24	48	95
Total		172	344	90

TABLE 4

Observer Reliability on Separate Items
Across the Cases: Test #2

Dependent Variables	Agree- ments	Disagree- ments	Percent of Agreement
Mother Behavior			
Lying on bed	150	0	100.00%
In chair	68	0	100.00
Asleep/distracted	191	33	85.0
Palms	33	10	77.0
Encradles	15	1	94.0
Finger caress	24	3	89.0
Rocks, bounces, shakes	15	3	89.0
Looks at	111	24	82.0
Feeds	7	1	88.0
Cares for	12	7	63.0
Talks to	1	0	100.0
Infant Behavior			
In crib	23	0	100.0
On bed	60	0	100.0
Mother's arms	11	0	100.0
Mother's lap	136	2	98.0
Sleeping/dozing	388	19	95.0
Awake	219	21	91.0
Mouths/grimaces	176	30	85.0
Moves	209	34	87.0
Tremor/shudder	54	18	75.0
Cries	9	0	100.0
Fusses	7	1	88.0
Sneezes	2	0	100.0
Grunts/sighs	14	4	78.0
Eyes open	97	36	75.0
Blinks	34	14	75.0
Eyes shut	459	22	95.0
Turns head to mother	1	0	100.0
Disinterested feeding	15	10	66.0

TABLE 5

Observer Reliability Between Author and Separate Observers: Test #3*

Dependent Variables	Author/Observer #1			Author/Observer #2		
	Number Agree	Number Disagree	Percent of Agreement	Number Agree	Number Disagree	Percent of Agreement
Infant Behavior						
Smacks lips	1	0	100.0%	--	--	--
Mouths, grimaces	16	2	88.0	15	2	88.0%
Moving	15	2	88.0	24	3	88.0
Tremor/shudder	3	0	100.0	4	0	100.0
Yawns	1	0	100.0	--	--	--
Sighs, grunts	4	1	80.0	--	--	--
Blinks	9	0	100.0	9	1	90.0

*Time: 20 minutes (40 observations for each observer) Not simultaneous.

CHAPTER IV

ANALYSIS AND DISCUSSION OF THE DATA

The objectives of this study were to (1) obtain a detailed description of maternal and infant behaviors in accordance with a predetermined list of variables; (2) identify the relationships among these variables, particularly in respect to the identification of the initiating and responding partners, and the nature of the interaction; and (3) discover whether there are differences in mother and infant behaviors related to maternal parity, race, infant sex, baby age, maternal rest adequacy, mother's perception of her labor experience, and previous handling of the baby.

Six specific questions were constructed as the basis for data analysis. It was felt that these particular questions would most effectively fulfill the intent of the objectives. The way in which the data was analyzed in respect to each question will be described separately followed by a discussion of that data.

The first question was: What were the frequencies of mother and baby behavior during the observation period? Table 6 shows the rank-ordered total and mean frequencies and standard deviations for the mothers. Table 7 shows these for the babies. (The total and mean frequencies

TABLE 6

Total and Mean Frequencies of Behavior for 26 Mothers*

Behavior	Total	Mean	S.D.
Lying on bed	10200	392.31	84.88
Asleep, dozing distracted	7746	297.92	90.56
Looks at baby	3923	150.88	88.26
Baby by side on bed	1982	76.23	109.11
Encradles	1358	52.23	51.72
Sitting on bed	1133	43.58	65.12
Finger Caresses	784	30.15	31.52
Talks to	732	28.15	46.28
Rocks, shakes, bounces	646	24.85	29.58
Talks about	441	16.96	15.30
Palms	386	14.85	20.06
Smiles at	379	14.58	17.65
Changes baby's position	367	14.16	12.58
Cares for	366	14.08	13.35
Shakes crib	347	13.35	39.96
Feeds	337	12.96	23.44
Standing	267	10.27	22.66
Baby on shoulder	257	9.88	20.59
Pats	219	8.42	11.51
Chair	178	6.85	22.57
Inspects	149	9.93	12.07
Gets help with	55	2.12	2.39
Attempts eye contact	41	1.58	1.60
Hugs, kisses	19	0.73	1.99
Imitates	10	0.38	0.90

*There were a possible 12480 ten-second observation units for each mother-baby pair.

TABLE 7

Total and Mean Frequencies of Behavior for 26 Babies

Behavior	Total	Mean	S.D.
Eyes shut	10214	392.85	92.92
Asleep, dozing	9269	356.50	62.18
Crib	7114	273.62	159.62
Moving	4104	157.85	68.64
Awake	2830	108.85	57.55
Mouths, grimaces	2767	106.42	58.05
Bed	2168	83.38	122.80
Eyes open	1827	70.27	64.76
Mother's lap	1569	60.35	75.39
Sighs, grunts	1493	57.42	27.79
Mother's arms	1157	44.50	39.83
Smacks lips	1045	40.19	35.42
Tremors, shudders	911	35.04	17.95
Sucks on object	703	27.04	37.89
Blinks	626	24.08	15.09
Fusses	543	20.88	22.92
Disinterested in feeding	179	6.88	15.54
Hiccoughs	151	5.81	9.74
Spits up	142	5.46	17.42
Eyes on mother's face	98	3.77	6.25
Sneezes	88	3.38	2.70
Cries	76	2.92	3.24
Yawns	73	2.81	3.41
Alert feeding	64	2.46	3.88
Avoids feeding	31	1.19	3.99
Burps	16	0.62	0.98
Turns head to mother	15	0.58	1.42

and standard deviations for all behaviors, separately listed, appear in Tables 37-88 in Appendix H.)

The overall frequency data indicate that there was great individual variability for both mothers and babies, but particularly mothers, as can be seen from the large number of behaviors that have standard deviations larger than their means. Therefore, while some observations can be made for the group as a whole, these may not fit the circumstances of any one individual.

Table 6 presents a general picture of the behavior of these mothers on the day of delivery, during the period in which they and their babies were being closely observed. Eighty-two percent of their time was spent lying in bed, with attention focused on the baby 38 percent of the time. (The use of the word 'time' in these descriptions refers to the number of 10-second units in which a particular behavior was observed and recorded.)

The primary baby-centered activity was 'looking at' him. This occupied 31 percent of the time. Next most commonly, (16 percent of the time), mothers picked their babies up and took them into bed with them. They held their arms around the babies, keeping them close to their bodies, (a behavior we have called 'encradling'), 11 percent of the time.

Among the low frequency items, there were only 55 instances (0.0045 percent) of the observation units in which a mother elicited help from the nursing staff in respect to her baby's care, appearance or behavior. There were only 41 attempts made to achieve eye contact with the baby, and only 19 instances in which a mother spontaneously hugged or kissed him.

Discussion of Table 6

Since normal mothers are generally permitted up as soon as they feel able, the large percent of time in bed noted for this sample may have indicated a need of these mothers for rest, rather than being a hospital-imposed restriction on their activity. In respect to the time spent being attentive to the babies, only five mothers had had prior opportunity to hold their babies, the rest just viewing them while still in the delivery room. Thus, it seems natural that they would occupy themselves in this manner. Further, it was noted that when the mothers were asked if they would participate in this study, they agreed primarily because it meant that their babies could be brought out immediately, and remain at the bedside.

The low frequency of asking for help with the baby did not appear to be related to the mother's parity or previous experience with infants. Rather, it seemed to indicate a certain self-sufficiency among these mothers. Both nursery and post-partum nurses were available to give help when asked, but as a general rule, did not actively try to find out what a given mother might need to know. A kind of cooperation often existed among the mothers (there were usually four in a room). More experienced ones would offer help to less experienced ones. This cooperation also extended to 'baby-sitting.' That is, if a mother were asleep or away from the room, another mother would see that her baby remained safe and comfortable.

There seemed, at first glance, to be a surprisingly low frequency of hugging and kissing the baby; but not when considered in conjunction with the frequencies of 'encradling' and the several other tactile and kinesthetic mother behaviors, since these occupied 29 percent of the mother's time. Perhaps mothers simply don't feel demonstrative toward their babies at first - see them as strangers - as Rubin (1963) has suggested. Another possibility is that mothers may be somewhat restrained by the obvious 'germ-consciousness' of the hospital personnel, who have developed rather elaborate ritualistic routines to minimize the chances of infection for both mothers and babies.

It had been expected that mothers would try to look into their babies' eyes more than occurred with this group, because of observations by Klaus (1970), Robson (1967), and Bowlby (1969). They have suggested that mothers have a strong urge to see their babies' eyes open at the time of delivery. Most of these mothers saw their babies at delivery. It has been this author's observation that a baby keeps his eyes wide open in a sort of stare, immediately after he is born, so that eye contact may occur more easily at this time.

Table 7 presents the frequencies of baby behaviors during the observation periods. This table suggests that there was very little 'fussing' or 'crying' (only 5 percent of the time). The babies, as a group, slept 74 percent of the time, and were kept in their cribs 5 percent of the time. Their 'awake' time was fairly active, as evidenced by the frequencies of moving, mouthing, sighing, lip-smacking, and shuddering.

Discussion of Table 7

A fairly common query about family-centered maternity units is: doesn't the babies' crying bother the mothers? This study showed that baby noise was minimal. The mothers sometimes did try to ignore their babies' fussing - in hopes he would settle back to sleep - but never allowed a baby to cry for very long without intervening. A means of successful intervention was something each mother tended to work out for herself, through a process of eliminating soothing measures until she found the most effective ones for her baby.

Baby sleeping is commonly thought of as cat-napping - brief snatches of light, restless sleep. These babies were observed to have cat-napping periods as they were getting ready to wake up, but also showed the ability to sleep quietly and apparently soundly for periods of a half-hour or more. Whether this is a sleep characteristic of newly delivered babies that changes in time, is not known.

When a baby was awake he seemed more often to engage in multiple activity than to lie quietly. An exception to this were the occasions on which he was given a pacifier or found his thumb to suck on. At such times, he remained fairly still. This relationship between sucking and decreased movement in infancy has been described by Wolff (1968).

Question #2 was: What are the most frequent ways for a mother to initiate interaction with her baby? What are her most frequent responses to his behavior? What is the range of behaviors? An initiating behavior was defined as one that was judged by the observer to have achieved a response from the partner. A response behavior was defined as one that was judged to have been made as a result of a behavior of the partner. For example: an initiating behavior was - baby cries; the response behavior was - mother shushes baby. This data analysis has not attempted to include a description and discussion of which specific initiating behaviors paired with which response behaviors, merely their rank-ordered frequency and range.

The frequencies of 10 mother-initiating and 14 mother-responding behaviors are shown in relation to the rank-ordered overall frequencies for those behaviors in Table 8. On numerous occasions two or more initiating or responding behaviors occurred together. These have been counted separately in the following interaction tables.

TABLE 8

Comparison of the Overall and Interactive Frequencies of Maternal Behavior

	f of overall occurrence	f as initiating behavior	IB* / OF	f as responding behavior	RB** / OF
Behaviors					
Looks at	3923	--	--	265	6.76%
Encradles	1358	4	0.29%	7	0.52
Finger caresses	784	69	8.80	29	3.70
Talks to	732	8	1.09	194	26.50
Rocks	646	25	3.87	71	10.99
Talks about	441	--	--	73	16.55
Palms	386	10	2.59	9	2.33
Smiles at	379	--	--	64	16.89
Changes baby's position	367	126	34.33	28	7.63
Cares for	366	36	9.84	46	12.57
Feeds	337	4	1.19	12	3.56
Holds baby on shoulder	257	1	0.39	2	0.78
Pats	219	16	7.31	21	9.59
Gets help	55	--	--	9	16.36

* Initiating behavior divided by overall frequency.

** Responding behavior divided by overall frequency.

Table 8 shows that 'changing the baby's position' and 'finger-caressing' were the most frequent ways for mothers to successfully initiate baby response. 'Looking at' and 'talking to' were the most frequent responses to baby behavior. In addition, Table 8 shows a comparison between the overall and the interactive frequencies of each mother behavior for the purpose of identifying the most effective interactive behaviors. 'Changing the baby's position' was an initiating behavior more times (34.33 percent) in respect to its overall frequency than any other mother-initiating behavior, thus more effective in eliciting baby response.

Table 9 shows the ranges of mother-initiating and responding behaviors ranked from most to least frequent. It also shows, for each behavior, its percent of the total initiating or responding frequency. For example, 'changing the baby's position' was successfully used to achieve a baby response more often (42.14 percent) than any of the other initiating behaviors. Mothers responded by 'looking at' the baby more often (31.93 percent) than by using any other response behavior.

Discussion of Tables 8 and 9

Mother response behaviors (as can be seen in Table 9) were generally of two types: those that were interventions to meet a baby's need (as for comfort, food, physical care) and those that were the mother's means of checking the baby to make sure he was all right, (as

TABLE 9

Ranges of Mother Initiating and Responding Behaviors

Mother Initiating Behaviors			Mother Responding Behaviors		
	f	%		f	%
Behavior			Behavior		
Changes baby's position	126	42.14%	Looks at	265	31.93%
Finger caresses	69	23.08	Talks to	194	23.38
Cares for	36	12.04	Talks about	73	8.80
Rocks	25	8.36	Rocks	71	8.56
Pats	16	5.35	Smiles at	64	7.71
Palms	10	3.34	Cares for	46	5.54
Talks to	8	2.68	Finger caresses	29	3.49
Encradles	4	1.34	Changes baby's position	28	3.37
Feeds	4	1.34	Pats	21	2.53
Holds baby on shoulder	1	.33	Feeds	12	1.45
			Gets help with	9	1.08
			Palms	9	1.08
			Encradles	7	.84
			Holds baby on shoulder	2	.24
Total	299	100.00%		830	100.00%

'looking at,' 'talking to,' 'talking about.' That is, mothers either responded in ways to soothe and care for their babies, or in ways that furthered the acquaintance process or were reassurances that all was well.

The frequencies of the same behavior as initiating and responding sometimes showed quite different patterns. For example, as Table 9 shows, 'changes the baby's position' produced more baby responses than any other mother-initiating behavior but was an infrequent way for her to respond to him. Since the mothers did seem intent on quieting and soothing their babies, it stands to reason that position change was not a frequent response because it would only stimulate them again.

However, while 'encradling' had a fairly high overall frequency, as shown in Table 8, it was not effective in initiating baby response nor used, to any extent, as a mother response. That it may not have provided enough stimulation to provoke baby response is understandable, but it is not clear why it was not a mother response more often unless mother intent was to put the baby down and leave him alone since he was quieted.

'Rocks' occurred with about equal effectiveness as an initiating and a responding behavior. The author noted that it was used with greater variation than the other mother interactive behaviors. That is, as an initiating behavior, it took on the character of 'shaking' the baby with a faster tempo. As a response behavior, 'rocks' was a slow and more soothing movement.

The most frequent mother responses were 'looking at,' 'talking to,' and 'talking about.' (See Table 9.) Overall, these three behaviors, coupled with 'smiles at' and 'gets help' accounted for 73 percent of her responses to his initiating cues. It is doubtful that the baby recognizes such non-tactile activities as having any connection with his own actions, at first. If, as Burns, (1972), Sander (1962) and Bettelheim (1968) have suggested, the baby's communication patterns are formed early--within the give-and-take relationship with the mother--then this observation may be significant.

Referring again to Table 9, there were 299 instances in which mothers used behaviors that successfully initiated baby response. All but one of the initiating behaviors ('talks to,' with a frequency of 8) provided tactile or kinesthetic input for the baby. It appears that these babies simply didn't respond effectively to the mothers' verbal or visual behaviors in relation to them. The high rate of visual/verbal (checking the baby out) responses may indicate that this is a strong need of mothers during their first contacts with their newborns. It may also be that mothers do not see their newborns as capable of or needful of interaction with them. This latter suggestion seems plausible, since most of the work relating to infant competency, stimulation and interactive functioning has been done within the past two decades. In this author's experience, it is not yet a part of infant-care content for mothers, or for those who teach mothers.

Question #3 was: What are the most frequent ways for a baby to initiate interaction with his mother? What are his most frequent responses? What is the range of behaviors?

Table 10 has been set up like Table 8, to show the rank-ordered overall frequencies of the baby interactive behaviors and to provide a percent comparison between the overall and the interactive frequencies of each behavior. For example, there were 543 recorded occurrences of 'fussing.' One hundred ninety-five of these times, it was a behavior that prompted mother response. That is, 35.91 percent of all the 'fusses' were successful initiators of mother response. Yet, of the 76 times babies' 'cries' were recorded, mother response was elicited 35 times, or 46.05 percent of all the crying occurrences. Thus, it appears to be a more effective means of gaining attention than fussing. 'Sneezing' was the second most effective eliciter of mother response, rating almost equally as high as 'crying.'

As Table 10 indicates, 3.94 percent of the times babies moved, it was in response to a mother action. Eight and ten one-hundredths percent of the times he sighed, it was in response to a mother action. In comparison with Table 8, it seems that mothers were much more active in responding to their babies, than babies to mothers. It

TABLE 10

Comparison of the Overall and Interactive Frequencies of Infant Behaviors

	f of overall occurrence	f as initiating behavior	% as initiating behavior	f as responding behavior	% as responding behavior
Behaviors					
Moves	4104	77	1.87%	162	3.94%
Mouths, grimaces	2767	74	2.67	31	1.12
Eyes open	1827	21	1.14	9	0.49
Sighs, grunts	1493	124	8.30	121	8.10
Smacks lips	1045	51	4.88	4	0.38
Tremor, shudder	911	59	6.47	57	6.25
Sucks object	703	13	1.84	3	0.42
Fusses	543	195	35.91	29	5.34
Hiccoughs	151	21	13.90	--	--
Spits up	142	28	19.71	3	2.11
Sneezes	88	40	45.45	--	--
Cries	76	35	46.05	6	7.89
Yawns	73	12	16.43	1	1.37

should be noted, however, that there were 20-second recording periods separating the observation units. It is possible that there were interactive behaviors during these times that would have cast a different light on the picture had they been recorded. Within the 10-second units observed, all interactions were composed of an initiation and a response, with no further interactive sequence.

The ranges of baby-initiating and baby-responding behaviors are shown in Table 11. As can be seen, 'fussing' was the most frequent, and accounted for 26% of all the occurrences in which a baby behavior drew mother response. The most frequent ways for babies to respond to mothers were moving, sighing, and by the 'tremor,' a reflex shudder.

Discussion of Tables 10 and 11

The observation that the baby's cry was the most effective means of getting mother response supports observations of Moss (1967) and Bowlby (1969) who suggest that it may be 'noxious' for the purpose of ensuring a response. Bowlby identifies the cry as one of the baby's innate motor patterns which is a releaser of mother response. It may also be effective because of its social connotation. In this society, crying tends to be associated with the idea of pain or sorrow. Furthermore, a baby or child cry may cause one to think of neglect, if it continues for very long. Baby behaviors with less

TABLE 11

Ranges of Baby Initiating and Responding Behaviors

Baby Initiating Behaviors			Baby Responding Behaviors		
	f	%		f	%
Behavior			Behavior		
Fusses	195	26.00%	Moves	162	38.12%
Sighs, grunts	124	16.53	Sighs, grunts	121	28.47
Moves	77	10.27	Tremor, shudder	57	13.41
Mouths, grimaces	74	9.87	Mouths, grimaces	31	7.29
Tremor, shudder	59	7.87	Fusses	29	6.82
Smacks lips	51	6.80	Eyes open	9	2.12
Sneezes	40	5.33	Cries	6	1.41
Cries	35	4.67	Smacks lips	4	.94
Spits up	28	3.73	Sucks object	3	.71
Hiccoughs	21	2.80	Spits up	3	.71
Eyes open	21	2.80			
Sucks object	13	1.73			
Yawns	12	1.60			
Total	750	100.00%		425	100.00%

'social labelling' may not bring to mind the same need for attention, if indeed, they are seen as needs for attention at all. Fussing was less effective in eliciting response, perhaps, because a mother could always hope her baby would settle back to sleep. Also, fussing is not as 'grating' on the ear, or communicative of the same sense of urgency.

Sneezing was effective in achieving mother response, although this response tended to be 'looking at' or 'talking to' rather than action-taking behavior. It seems that mothers worry over the baby's sneeze because it is associated with illness. Thus, a frequent and early explanation to mothers is that the baby sneeze is probably no more than his way of dealing with the lint and dust he inhales. Sneezing was a good example of a behavior eliciting a mother 'checking-out' response.

'Spitting-up' occurred 142 times but initiated mother response only 28 times, at least within the 10-second observation units. These mothers were not given any specific instructions about what to do if their babies spit-up, although bulb syringes were kept in each crib for use in the case of choking. In one instance, the author may have been an interfering influence since it wasn't possible to ignore the spitting, choking baby for very long. Hence, her intervention may have interfered with a response that the mother might have made if she had waited.

There was an interesting complex of baby behaviors that were observed in combination over and over again. These were: moving, mouthing, sighing, and lip-smacking. When a baby awoke, these gradually came into play. Then, he would either fall back to sleep or, finding that his signals were not getting response, begin to fuss. When fussing didn't result in response, he would begin to cry. One wonders whether the mother's ignoring of the baby's pattern over time might not condition him to cry. In the brief observation period, no baby was permitted to cry for long, but in all cases, the above-mentioned behaviors signalled that it was coming.

The 'tremor' was noted to act like the startle reflex, in response to a sudden movement or noise, although it sometimes occurred spontaneously when the baby was sound asleep. This may be a reflexive means of providing physiological stabilization to the baby, much as an adult 'shiver.' It frequently occurred with a sigh, the two behaviors providing the baby with brief overall movement and provoking a deep breath. It is mentioned here because, while reflexive, it acted as both an initiating and a responding behavior.

In all, babies initiated 70 percent of the 1049 interactions while mothers initiated only 30 percent of them.

Question #4 was: Do mothers follow a predictable pattern of handling their new infants? More specifically, do mothers handle their babies with their finger-tips during their first contacts, progressing from this to handling with the palms of their hands, and, finally bringing the babies into close contact by encradling them in their arms?

Table 12 shows the frequencies of these three different modes of handling as they occurred in the first, second and third portions of the collective observation sessions. Since it was not possible to reach a conclusion based on this table alone, two graphs were drawn which permit one to visualize the handling pattern more clearly.

Figure 1 shows the percent curve for each of the three modes of handling in each third of the combined observation sessions. The percents were calculated by dividing the mean frequencies of each handling mode by the mothers' 'awake-and-attentive-to-baby' frequencies. This provided a more easily interpreted picture of what the handling progression was really like.

As can be seen, all three modes of handling were considerably higher in the first segment. Encradling stands out as being much more frequent than either of the other modes. Finger-caressing was the next most frequent and palming had the lowest percent. This order persisted in the second and third segments. However, in the middle segment, all handling modes showed drastic decreases. Then, in the third segment, finger caressing and palming appear to be leveling off at almost their

TABLE 12

Frequencies of Maternal Handling Modes During the Observation Sessions

	1st Third		HF/MAF	2nd Third			3rd Third		
	T	Mean	%*	T	Mean	%	T	Mean	%
Finger-caressing	470	18.08	23.73%	154	5.92	5.27%	160	6.15	5.87%
Palming	253	9.73	12.77	55	2.12	1.88	78	3.00	2.85
Encradling	754	29.00	38.06	202	7.77	6.92	402	15.46	14.68

*This percent was based on the number of observational units in each third of the observation that the mothers, as a group, were awake and paying attention to their infants. (Handling frequency/mother-awake frequency.)

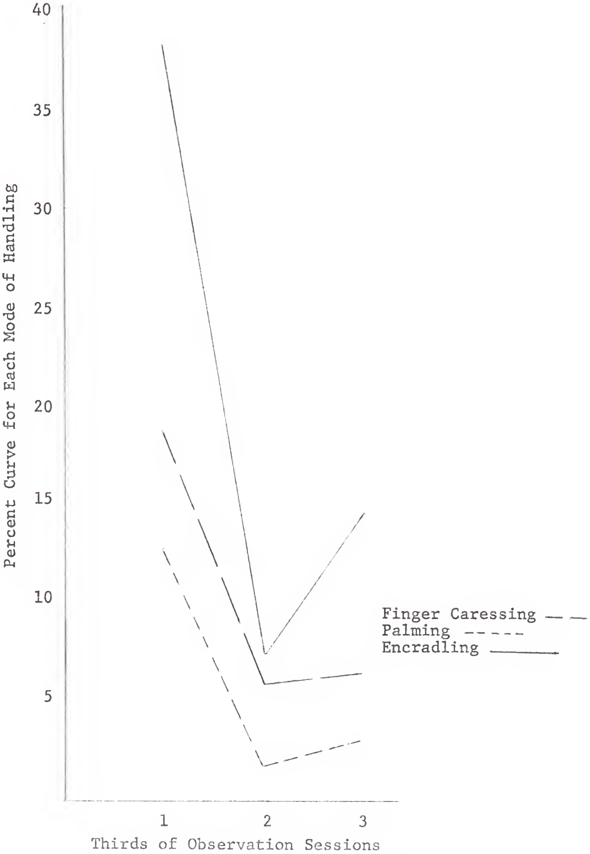

Figure 1. Percent Curve for Three Modes of Handling During Thirds of the Combined Observation Sessions

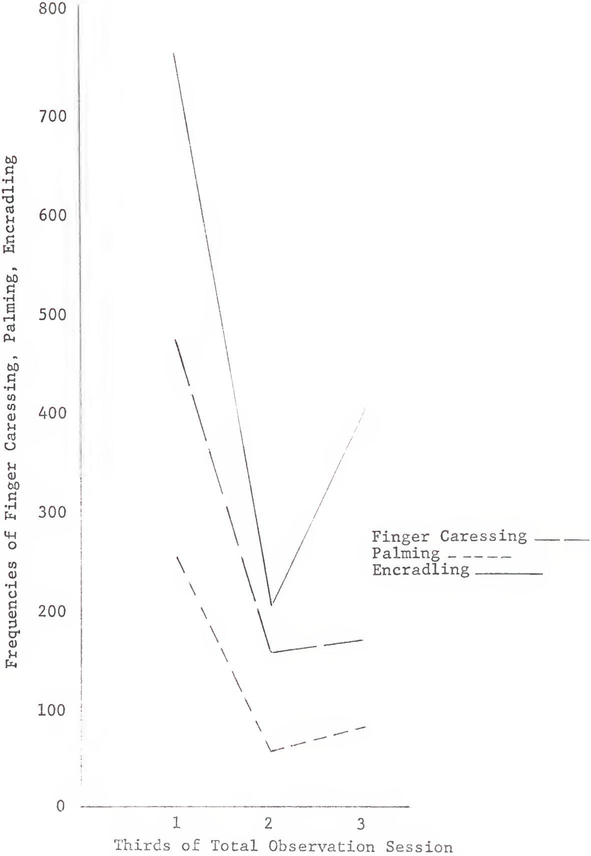

Figure 2. Relationship Among Three Handling Methods During Thirds of the Combined Observation Sessions

lowest points while encradling shows a rapid increase. A second graph merely plotted the mean frequencies. It shows itself to be almost identical to the first graph.

Discussion of Figures 1 and 2

These graphs indicate that encradling did not follow a pattern of increase from the first, to second, to third segments. It appeared to be the most frequent handling mode during the mothers' earliest contacts with their babies, rather than the least frequent. Palming dropped to the lowest point of all handling modes in the middle segment instead of showing a greater frequency. However, finger-caressing did follow the anticipated pattern, being much more frequent at first than it was later on. These observations lend partial support to a study by Klaus et al. (1970) in terms of the fingering pattern. However, the timing and mode of his data collection was different, thus making direct comparison unsuitable. Klaus made a 10-minute film for each of 12 mothers with normal, full-term babies at the time of their first contact. This occurred from 30 minutes to 13½ hours after delivery. His mothers showed an orderly progression of behavior beginning with the mother's fingering of the baby's extremities, and changing to massaging and encompassing palm contact to the baby's trunk in 4-8 minutes. In the first three minutes there was a 52 percent fingering frequency and a 28 percent palming frequency. In the last three minutes, there was a 26 percent fingering frequency and a 62 percent palming frequency.

Another observation about these two graphs is that there appears to be a flurry of all handling modes in the beginning - almost as though these mothers couldn't get enough of their babies. Then, as if they were satiated, all handling drops to the lowest levels. Finally, the less frequent finger-caressing and palming modes tend to level off at almost their lowest points, in a way suggesting that the mothers had finished with them. Encradling remains, in the third segment, as clearly the handling method of choice. This trend is also supportive of Klaus' (1970) and Rubin's (1963) work, since they both indicated encradling to be used more in later contacts.

Question #5 was: What is the percent of observed frequencies in which babies use initiating behaviors without being responded to by their mothers? The behaviors identified as 'initiating' were those that had been recorded by the observers as receiving the mothers' responses.

These are presented in Table 13. The first column of figures shows the percent of recorded instances of a behavior when it functioned as an initiating behavior. The second column shows the difference - that is, the time in percent that the baby used the behavior without achieving response.

Discussion of Table 13

Even the most frequently responded-to baby behaviors did not achieve feedback 50 percent of the time. Seventy-seven percent of them failed to provoke mother response

80 percent of the time, or more. As has been mentioned earlier, this may be due to a general lack of knowledge about the baby's capacity for interacting with his environment (mother) and his need for contingent feedback as the means by which he gradually learns who he is, what he can do, how he relates to the world - and the world, to him. There are other possible reasons.

TABLE 13

Percent of Time a Baby Initiating Behavior was not Responded to by the Mother

Baby Initiating Behaviors	% as Initiating Behavior	% Not Responded To
Moves	1.87%	98.13%
Mouths, grimaces	2.67	97.33
Eyes open	1.14	98.86
Sighs, grunts	8.30	91.70
Smacks lips	4.88	95.12
Tremor, shudder	6.47	93.53
Sucks object	1.84	98.16
Fusses	35.91	64.09
Hiccoughs	13.90	86.10
Spits up	19.71	80.29
Sneezes	45.45	54.55
Cries	56.05	53.95
Yawns	16.43	83.57

There has, in the past, been an infant-rearing dictum warning mothers against responding too much and too soon to their babies' signals - lest they spoil them. It is understandable, indeed observable, that many mothers hold to this idea today. Furthermore, as far as this group was concerned, they were given no instructions about what to do, or not do, for their babies except for brief 'general care' instructions. If mothers attempted to do as the 'nurses' did, in respect to their babies, then observation at the nursery window would have revealed very little infant-caretaker interaction except for the routines of feeding, diaper-change, and bathing. Why, then, would one expect mothers to respond any more than was observed in this group?

The final question was: What differences in maternal and infant behavior might be attributable to the independent variables?* These were:

1. maternal parity
2. infant sex
3. race
4. mother's perception of the labor experience
5. mother's perception of her sleep and rest adequacy in the previous 24 hours
6. mother's previous handling of her baby

---

*One independent variable, the baby's age at the onset of data collection, was omitted from the data analysis because the data relating to it was insufficient to work with.

In order to arrive at an answer to this question, the raw data were tabulated so that the means and standard deviations of each behavior could be examined in respect to each of the independent variables. These tables are in Appendix H. If the difference in mean frequency for a given behavior (for example, between boy and girl infants) was more than half the standard deviation for the total population, then this dependent/independent variable pair was subjected to a one-way analysis of variance. Table 37, which lists all the data sets so eliminated, is in Appendix G.

There were 312 data sets (a mother, or a baby, behavior and one of the six independent variables). One hundred and forty-nine of these were examined in this way. Of all of these, only 22 were found to have a significant F ratio, using a probability of P. = .05. These tables, with a description and discussion of each, have been organized according to the independent variables, and are presented in the following paragraphs. It should be pointed out that, of all the combinations, only 22 were significant. This may have been due to chance. Therefore, these results should be taken as heuristic, indicating the need for further study, rather than as generalizable now. Furthermore, it should be brought to mind that these analyses were run on data that did not have a normal distribution.

Some of the significant differences suggest plausible explanations, but there are others that are difficult to explain on the basis of these data. For example, some of the dependent variables paired with more than one independent variable to indicate significant difference. It may be that interaction effects, which were not investigated, would have facilitated some of the explanations.

Differences Attributable to Maternal Parity

These were: babies of primiparas were more disinterested in their feedings than babies of multiparas (Table 14); primiparous mothers fed their babies more often than multiparous mothers (Table 15); and multiparous mothers attempted to attain eye contact with their babies more often than primiparous mothers (Table 16).

Table 14 suggests that first-born babies are less interested in feeding than other-borns (F=5.841).* This could have been due to the possibility that the primiparas did not possess the same level of skill in prompting their babies to stay awake and suck as the multiparous mothers. However, other influences such as the nature of the baby's birth experience or the mother's ease (or dis-ease) in feeding her baby while being observed, could have been important factors.

Table 15 indicates that primiparous mothers also fed their babies more than multiparous mothers (F=6.245).

---

*All analyses, with the exception of those utilizing the labor experience as an independent variable, had 1 and 24 degrees of freedom.

TABLE 14

Analysis of Variance: Disinterested Feeding by Parity

Group	Total: Disinterested Feeding by Parity	Mean: Disinterested Feeding by Parity
Primiparas (N=8)	136.00	17.0000
Multiparas (N=18)	43.00	2.3889

Source	SS	df	MS	F
Between Groups	1182.3762	1	1182.3762	5.841
Within Groups	4858.2773	24	202.4282	$(p \leq 0.022)$
Total	6040.6525	25		

TABLE 15

Analysis of Variance: Feeding Frequency by Parity

Group	Total: Feeds	Mean: Feeds
Primipara (N=8)	229.0000	28.6250
Multipara (N=18)	108.0000	6.0000

Source	SS	df	MS	F
Between Groups	2835.0898	1	2835.0898	6.245
Within Groups	10895.8750	24	453.9946	$(p < 0.019)$
Total	13730.9648	25		

Again, if one assumes that multiparas have had previous infant-feeding experience, they may not have needed to take as much time. Furthermore, since all of the mothers were advised by the nursery staff to get at least an ounce of formula into their babies per feeding, and since the primiparas seemed to meet with less success in doing this, it is understandable that they would make more attempts. These data support the findings of a study by Thoman (1970). She also found primiparas spent more time with less success in getting their babies to eat.

The final behavioral difference attributable to maternal parity was that the mothers' attempts to attain eye contact with their babies were more frequnt for multiparas (F=6.314). This is shown in Table 16.

TABLE 16

Analysis of Variance: Eye Contact Attempt by Parity

Group	Total: Eye Contact Attempt	Mean: Eye Contact Attempt
Primiparas (N=8)	4.0000	0.50000
Multipara (N=18)	37.0000	2.0556

Source	SS	df	MS	F
Between Groups	13.4017	1	13.4017	6.314
Within Groups	50.9445	24	2.1227	($p < 0.018$)
Total	64.3462	25		

It is suggested that these mothers, who had had other babies, may have felt more at ease in adjusting their's and the babies' positions so that eye contact would be possible. This finding differs from a report by Robson (1967) who observed no differences in attempts at eye contact according to parity.

Differences Attributable to Race

These are presented in Tables 17, 18, 19, and 20. Table 17 shows that white mothers encradled their babies more than black mothers (F=7.379); Table 18, that white mothers attempted eye contact more (F=5.685); Table 19, that white mothers smiled at their babies more (F=11.565); and Table 20, that white mothers held their babies in their arms more (F=10.255).

In considering the possible reasons for these differences in mother-attentiveness to her infant, it should be taken into consideration that there are class, as well as race, differences - and these are not easily separable. While the participants in this study were selected from the medically indigent 'clinic' population, one cannot assume that class differences have been ruled out entirely. There seem to be social and cultural reasons, rather than race reasons, for the differences noted in these tables.

For example, black mothers may have found adjustment to the role of a hospital patient more difficult than the white mothers, since the routines tend to be set

TABLE 17

Analysis of Variance: Encradling by Race

Group	Total: Encradling	Mean: Encradling
White Babies (N=14)	1050.0000	75.0000
Black Babies (N=12)	308.0000	25.6667

Source	SS	df	MS	F
Between Groups	15726.0000	1	15726.0000	7.379
Within Groups	51146.6875	24	2131.1118	($p < 0.012$)
Total	66872.6875	25		

TABLE 18

Analysis of Variance: Eye Contact Attempts by Race

Group	Total: Eye Contact Attempt	Mean: Eye Contact Attempt
White Babies (N=14)	31.0000	2.2143
Black Babies (N=12)	10.0000	0.8333

Source	SS	df	MS	F
Between Groups	12.3223	1	12.3223	5.685
Within Groups	52.0238	24	2.1677	($p < 0.024$)
Total	64.3461	25		

TABLE 19

Analysis of Variance: 'Smiling At' by Race

Group	Total: Smiles At	Mean: Smiles At
White Babies (N=14)	332.000 0	23.7143
Black Babies (N=12)	47.0000	3.9167

Source	SS	df	MS	F
Between Groups	2532.5703	1	2532.5703	11.565
Within Groups	5255.7773	24	218.9907	($p < 0.003$)
Total	7788.3477	25		

TABLE 20

Analysis of Variance: Baby in Arms by Race

Group	Total: Baby in Arms	Mean: Baby in Arms
White Babies (N=14)	900.00	64.2857
Black Babies (N=12)	257.00	21.4167

Source	SS	df	MS	F
Between Groups	11874.7109	1	11874.7109	10.2555
Within Groups	27791.7891	24	1157.9912	($p < 0.004$)
Total	39666.5000	25		

according to white, middle-class standards. This could have caused them to act unnaturally, perhaps more undemonstrative than they would be at another time and place. Also, placing the black mother in the dependent role within a predominantly white milieu, in all probability made her feel more subdued and helpless, less able to act naturally - particularly while being observed by a white person as was the case with these mothers. Despite the fact that all the black mothers had readily agreed to participation in this study, their reason for consent may have been based on a desire to 'be a good patient,' to cooperate so as to receive better care. Further, the blacks in this area have, until recently, delivered their babies at home with the assistance of a midwife. They have not had as long a time, as a group, to become used to the roles and relationships involved in hospital maternity care. It seems understandable that the white and black mothers would differ behaviorally for these reasons.

The differences in baby behavior attributable to race are shown in Tables 21, 22, and 23. These were: white babies yawned more (F=5.50), sighed more (F=4.87), and looked at their mothers' faces more (F=7.74). It is possible that the white mothers' additional handling of their babies soothed and relaxed them enough to prompt the greater number of yawns and sighs.

Differences Attributable to Infant Sex

There was only one difference which emerged in respect to the baby's sex (Table 24). Boy babies moved more than

TABLE 21

Analysis of Variance: Baby Yawn by Race

Group	Total: Baby Yawns	Mean: Baby Yawns
White Babies (N=14)	58.0000	4.1429
Black Babies (N=12)	15.0000	1.2500

Source	SS	df	MS	F
Between Groups	54.0742	1	54.0742	5.500
Within Groups	235.9644	24	9.8318	($p < 0.026$)
Total	290.0383	25		

TABLE 22

Analysis of Variance: Baby Sighs (Initiating) by Race

Group	Total: Baby Sighs	Mean: Baby Sighs
White Babies (N=14)	91.00	6.50
Black Babies (N=12)	33.00	2.75

Source	SS	df	MS	F
Between Groups	90.8657	1	90.8657	4.871
Within Groups	447.7500	24	18.6563	($p < 0.035$)
Total	538.6157	25		

TABLE 23

Analysis of Variance: Infant Eyes on Mother by Race

Group	Total: Eyes on Mother	Mean: Eyes on Mother
White Infants (N=14)	92.00	6.57
Black Infants (N=12)	6.00	0.50

Source	SS	df	MS	F
Between Groups	238.1868	1	238.1868	7.741
Within Groups	738.4287	24	30.7679	($p < 0.010$)
Total	976.6155	25		

TABLE 24

Analysis of Variance: Baby Movement by Baby Sex

Group	Total: Baby Movement	Mean: Baby Movement
Boy Babies (N=10)	1954.00	195.40000
Girl Babies (N=16)	2150.00	134.3750

Source	SS	df	MS	F
Between Groups	22917.2500	1	22917.2500	5.798
Within Groups	94868.1875	24	3952.8411	($p < 0.023$)
Total	117785.4375	25		

girl babies (F=5.798). This finding supports the work of both Moss (1967) and Lewis (1972), both of whom found that infant boys tended to be more active and irritable than girls. It may be significant, however, that the difference - for this group - was observable so soon after birth.

Differences Attributable to the Mother's Perception of Her Labor Experience

Table 25 shows that babies of mothers who had perceived their labor experiences to be good, initiated the mother's response by sucking (as on thumb or pacifier) more than the other mothers (F=5.860).* It is possible that those mothers, simply, were less concerned with their own needs because they were pleased with the labor outcome - thus, more able to respond to their babies' activities.

Table 26 indicated that mothers who felt indifferent about their labors responded to their babies' behaviors by changing their positions more frequently than the other mothers (F=4.375). This is difficult to explain on the basis of this data alone.

Table 27 shows that the mothers who thought their labor experiences had been bad ones, attempted eye contact with their babies more often than the other mothers (F=4.479). It seems possible that those mothers may have been more concerned over the conditions of their babies and used this visual behavior as a means of checking the babies.

---

*Degrees of freedom where labor was the independent variable were 2 and 23.

TABLE 25

Analysis of Variance: Baby Suck (Initiating) by Mother Labor Perception

Group	Total: Baby (I) Suck		Mean: Baby (I) Suck
Labor: Good (N=3)	8:00		2.6667
Labor: Indifferent (N=12)	1.00		0.0833
Labor: Bad (N=11)	4.00		0.3636

Source	SS	df	MS	F
Between Groups	16.3712	2	8.1856	5.860
Within Groups	32.1288	23	1.3969	($p < 0.009$)
Total	48.5000	25		

TABLE 26

Analysis of Variance: Change Baby's Position (Responding) by Labor Perception

Group	Total: Position Change (R)	Mean: Position Change (R)
Labor Perception		
Good (N=3)	6.0000	2.0000
Indifferent (N=12)	4.0000	0.3333
Bad (N=11)	18.0000	1.6364

Source	SS	df	MS	F
Between Groups	12.6340	2	6.3170	4.375
Within Groups	33.2121	23	1.4440	($p < 0.024$)
Total	45.8461	25		

TABLE 27

Analysis of Variance: Eye Contact Attempt by Labor Perception

Group	Total: Eye Contact Attempt	Mean: Eye Contact Attempt
Labor Perception		
Good (N=3)	2.0000	0.6667
Indifferent (N=12)	11.0000	0.9167
Bad (N=11)	28.0000	2.5455

Source	SS	df	MS	F
Between Groups	18.0356	2	9.0178	4.479
Within Groups	46.3106	23	2.0135	($p < 0.022$)
Total	64.3462	25		

Differences Attributable to the Mother's Perception of her Sleep Adequacy

Table 28 shows that mothers who felt tired left their babies in their cribs more than the non-tired mothers (F= 7.663). This seems understandable, since they probably wanted to rest, undisturbed, themselves. Tables 29 and 30 show that the babies of tired mothers moved more (F=4.967) and initiated more mother responses by sighing than the other babies (F=7.652). There may have been more baby movement because the mothers, feeling their own need for rest, did not pay as much attention to them. The fact that baby sighs initiated more mother response in the

TABLE 28

Analysis of Variance: Baby in Crib by
Mother Sleep Adequacy

Group	Total: In Crib	Mean: In Crib
Adequate sleep, rest (N=16)	3406.00	212.8750
Inadequate sleep, rest (N=10)	3708.00	370.7998

Source	SS	df	MS	F
Between Groups	153479.0000	1	153479.9999	7.663
Within Groups	480697.0000	24	20029.0391	($p < 0.010$)
Total	634176.0000	25		

TABLE 29

Analysis of Variance: Baby Movement by
Mother Sleep Adequacy

Group	Total: Movement	Mean: Movement
Adequate sleep, rest (N=16)	2173.00	135.8125
Inadequate sleep, rest (N=10)	1931.00	193.1000

Source	SS	df	MS	F
Between Groups	20196.0625	1	20196.0625	4.967
Within Groups	97589.3750	24	4066.2239	($p < 0.034$)
Total	117785.4375	25		

TABLE 30

Analysis of Variance: Baby Sigh (Initiating) by Mother Sleep Adequacy

Group	Total: Baby Sigh	Mean: Baby Sigh
Adequate sleep, rest (N=16)	48.00	3.00
Inadequate sleep, rest (N=10)	76.00	7.60

Source	SS	df	MS	F
Between Groups	130.2156	1	130.2156	7.652
Within Groups	408.4001	24	17.0167	($p < 0.010$)
Total	538.6157	25		

TABLE 31

Analysis of Variance: Caring For by Mother Sleep Adequacy

Group	Total: Caring For	Mean: Caring For
Adequate sleep, rest (N=16)	308.0000	19.2500
Inadequate sleep, rest (N=10)	58.0000	5.8000

Source	SS	df	MS	F
Between Groups	1113.2461	1	1113.2461	7.988
Within Groups	3344.6016	24	139.3584	($p < 0.009$)
Total	4457.8477	25		

TABLE 32

Analysis of Variance: Rocks (Responding) by Sleep Adequacy

Group	Total: Rocks (R)	Mean: Rocks (R)
Adequate sleep, rest (N=16)	65.0000	4.0625
Inadequate sleep, rest (N=10)	6.0000	0.6000

Source	SS	df	MS	F
Between Groups	73.7778	1	73.7778	5.011
Within Groups	353.3376	24	14.7224	($p < 0.033$)
Total	427.1152	25		

'tired' group could have occurred because the mothers associated the sigh with being tired and were identifying baby fatigue, as well as their own fatigue.

As indicated by Table 31 the mothers who felt rested entered more into their babies' care than the others (F= 7.988). Table 32 indicates that rested mothers also responded to their babies initiating behaviors by rocking them more than the others (F=5.011). Thus, a mother's feeling that her own needs for rest and sleep had been met was apparently a significant influence on the nature of her earliest interactions with her baby.

Differences Attributable to the Mother's Previous Handling of the Baby

Tables 33, 34, and 35 show that mothers who had handled their babies prior to these observations (1) used their palms in handling, as a response to the baby's behavior, more than those who had not handled their babies (F= 5.652); (2) babies initiated more mother responses by moving (F=7.382); and (3) babies looked at their mothers' faces more (F=12.923).

TABLE 33

Analysis of Variance: Palming (Responding) by Previous Handling

Group	Total: Palming (R)	Mean: Palming (R)
Handled Baby (N=5)	5.0000	1.0000
Didn't Handle Baby (N=21)	4.0000	0.1905

Source	SS	df	MS	F
Between Groups	2.6465	1	2.6465	5.652
Within Groups	11.2381	24	0.4683	($p < 0.024$)
Total	13.8846	25		

TABLE 34

Analysis of Variance: Baby Movement (Initiating) by Previous Handling

Group	Total: Baby (I) Movement	Mean: Baby (I) Movement
Handled Baby (N=5)	30.00	6.0000
Didn't Handle Baby (N=21)	47.00	2.2381

Source	SS	df	MS	F
Between Groups	57.1520	1	57.1520	7.382
Within Groups	185.8096	24	7.7421	($p < 0.012$)
Total	242.9616	25		

TABLE 35

Analysis of Variance: Baby Eyes on Mother by Previous Handling

Group	Total: Eyes on Mother	Mean: Eyes on Mother
Handled Baby (N=5	56.00	11.20000
Didn't Handle Baby (N=21)	42.00	2.0000

Source	SS	df	MS	F
Between Groups	341.8154	1	341.8154	12.923
Within Groups	634.8000	24	26.4500	($p < 0.002$)
Total	976.6154	25		

It is not readily apparent, on the basis of these data, why these three variables should stand out. However, the recent work of Klaus et al. (1970, 1972) and Barnett et al. (1970) suggests that the timing of the mother's contacts with the baby does influence her behavior toward him - and, consequently, his toward her.

On the face of it, these data suggest that the particular independent variables selected for analysis in this study are not important influences on first-day mother/baby behavior and that there may be biological factors which are operant.

Summary

In summary, the data analysis revealed the following findings. There was great individual variability for both mothers and babies, but particularly mothers. The most frequent mother behaviors were: 'lying in bed,' 'sleeping or dozing,' 'looking at the baby.' 'Imitating' the baby, or spontaneously hugging and kissing him, were her least frequent behaviors. The most effective mother behavior in achieving response was 'changing baby's position.' Babies had their eyes shut most of the time, appearing to be asleep or dozing. They fussed and cried very little. When awake, they tended to be active rather than still, using a combination of moving, mouthing, sighing behaviors.

There were 10 behaviors used by mothers to initiate baby response, the most frequently observed ones being 'changes baby's position' and 'finger-caresses.' There were 14 mother responses. 'Looking at' the baby and 'talking to' him were the most common. 'Looking at' was identified as a checking-out kind of response, rather than an interactive response. Seventy-three percent of all the mothers' responses were 'checking-out' rather than interactive behaviors. Of the babies' 13 initiating behaviors, 'crying,' 'fussing,' and 'sneezing' were the most frequently used. Babies responded in 13 different ways, moving and sighing being the most frequent. There was a complex of baby behaviors, moving, mouthing, sighing and lip-smacking, which occurred as preliminaries to fussing in almost all cases. The babies initiated 70 percent of the interaction, while mothers only initiated 30 percent of them.

An examination of the mothers' handling of their babies by finger-caressing, palming and encradling showed that there was a higher frequency of all of these in the first part of the observation session than later - particularly 'encradling.' During the middle part, all handling dropped off, and in the last part, 'encradling' emerged alone as the main handling behavior.

When a comparison was made between the overall frequencies of the 13 baby-initiating behaviors and their occurrences when achieving mother response, it was found that even the most frequently responded-to behaviors achieved feedback less than 50 percent of the time.

The analysis of variance tables revealed 22 significant differences in mother and baby behaviors that were apparently attributable to the independent variables, but such a small proportion of significances in respect to the multiple tests run suggests that some may have shown a significance due to chance. While they are interesting, they should be subjected to further study. They are as follows:

Independent Variable	Dependent Variable
Maternal parity	First-born babies were more disinterested in their feedings.
	Primiparas fed their babies more often.
	Multiparas attempted to achieve eye contact more often.
Race	White mothers encradled their babies more than black mothers, attempted eye contact more often, smiled at their babies more, and held the babies in their arms more frequently.
	White babies yawned more, sighed more, turned their heads to their mothers more, and looked at their mothers' faces more.
Infant sex	Boy babies moved more than girl babies.
Mother's perception of labor as a good experience	Mothers responded to their babies' sucking behavior more than mothers who reacted indifferently to their labor experiences, or those who felt the experience was a bad one.

Independent Variable	Dependent Variable
Mother's reaction to labor experience indifferent	Mothers changed the babies' positions, as a response to their behavior, more often.
Mother's perception of labor as a bad experience	Mothers attempted eye contact more often.
Mother's perception of sleep and rest as adequate	Mothers engaged in caretaking activities more, responded to their babies' behavior by rocking them more than mothers who did not feel rested.
Mother's perception of sleep and rest as inadequate	Mothers left their babies in their cribs more. Babies moved and sighed more.
Mother had previously handled the baby	Mothers responded to baby behavior by using the 'palming' handling mode more often; also, responded more often to their babies' movement. Babies looked at their mothers' faces more.

CHAPTER V

SUMMARY AND CONCLUSIONS

SUMMARY:

The purpose of this study was to describe mother and infant behaviors during a six-hour observation period on the day of delivery. It was undertaken because of the cumulative evidence that maternal-infant interactive behaviors are affected by the experiences of early post-natal life, and that the behavior of each partner is influenced by that of the other partner. A review of the literature, while it did not provide conclusive evidence, suggested that:

> The pattern for the infant's future communication ability may be partly influenced by the sensitivity and appropriateness of his caretaker's responses to his signals.
>
> The quality of the infant's attachment to his mother is, apparently, dependent upon the quality of their interaction from the point of birth, and influences his cognitive development.
>
> Contact between the mother and infant immediately after birth may influence the development of her maternal behavior.

> Human, as well as animal mothers, appear to have patterned species-specific behaviors in relation to their newborns which may be necessary to the optimal development of their interaction.
>
> There is, apparently, an epigenetic aspect to the development of the mother-infant relationship, certain interactive tasks being the prerequisites for the successful completion of succeeding tasks.
>
> The newborn infant has the capacities for interchange with his environment and for some control over it.
>
> The quality and quantity of stimulation provided a newborn infant determines, to some extent, his psychological and mental responses to his environment.

It was found that there were insufficient descriptive data in the literature about the general and interactive behaviors of mothers and their newborn babies when observations were made and recorded over an extended period of their time together. Therefore, this study was designed to:

1. make direct observations of the behaviors of selected mother-baby pairs on their delivery day, as a basis for examining the beginning sequences of their interactions

and for identifying their needs as interdependent units during hospitalization.

2. obtain data which provide insights into the process by which the mother, as her baby's primary source of environmental input, influences his development.

A list of behavioral variables for both mother and baby was developed. Then the independent variables thought most likely to affect these were identified. There were several mother-infant interaction studies that provided some direction for this task. These studies also suggested some ways in which a time-sampling technique could be used. The instruments for this study were then developed, and pilot observations were made to test and refine the methods of observing and recording data and to establish inter-observer reliability.

The subjects were 26 normal mothers who had received clinic care, delivered normal, full-term babies, and were bottle-feeding. They had been hospitalized for delivery at Shands Teaching Hospital between June 12 and August 2, 1973. Each pair was 18 hours or less post-delivery at the time the observations were begun. There were 480 ten-second observations recorded for each subject pair, and 12480 observations for the total sample.

Six specific questions were asked as a basis for the data analysis. These were:

1. What are the frequencies of mother and baby behaviors during the observation period?

2. What are the most frequent ways for a mother to initiate an interaction with her baby? What are her most frequent responses to his cues? What are the ranges?

3. What are the most frequent ways for a baby to initiate interaction? What are his most frequent responses to his mother's interactive behavior? What are the ranges?

4. Do mothers follow a predictable pattern of handling their new babies?

5. What percent of the time is used by babies to initiate the mother's response without being responded to?

6. Can differences in any of the above findings be attributed to the selected independent variables?

   a. maternal parity
   b. race
   c. infant sex
   d. previous handling of the baby by his mother
   e. the mother's perception of the labor experience
   f. the mother's perception of her sleep and rest adequacy

The data analysis showed that there was great individual variability for both mothers and babies, but particularly mothers. The most frequent 'mother' behaviors were 'lying in bed,' 'sleeping/dozing,' and 'looking at the baby.' 'Imitating the baby' and 'hugging/kissing him' were her least frequent behaviors. A handling pattern showing the highest frequencies of encradling, palming and finger-caressing during the first third of the observation sessions emerged. The presence of a handling pattern may be significant in view of the recent research on interactional deprivation in mothers (Klaus et al., 1970, 1972). These studies have suggested that the quality and quantity of a mother's immediate postpartum contact with her baby may be an important influence on her development of mothering skills. Longitudinal studies which draw relationships between the nature of the early contacts and later patterns of interaction are needed. The most effective 'mother' behavior in achieving response from the baby was 'changing his position.' The most common 'mother' responses to the baby's initiating behaviors were visual and verbal in nature. Thus mothers tended to respond in ways unrecognized by their babies as being associated with their activity.

On the whole, the mothers indicated that they wanted their babies with them, yet they had very few questions about caring for them. Their use of assistance from the nursing staff tended to involve their own needs for physical care.

The babies, as a group, cried very little and slept the majority of the time. A particularly interesting and frequent pattern of their behavior was a combination of lip-smacking, moving, mouthing and sighing. This was interpreted by the author as a signal for response, but was rarely responded to by the mothers. Unless the baby fell back to sleep, he followed this pattern with fussing and, finally, crying. Crying was his most effective behavior in bringing the desired attention. Thus the mothers tended to respond at the end of a chain of behaviors rather than perceiving his early ones as significant.

It was felt that the disparity between the baby's cues and the mother's responses was important, since the baby's means of learning who he is, how he relates to the world, and what he can do to control what happens to him, are within the give and take relationship with his mother (Bettelheim, 1968). It may be that the customary hospital practice of wrapping babies tightly in receiving blankets before taking them to their mothers has discouraged the mothers' use of close contact behaviors - at least until they go home. However, it may also be that the high visual/verbal behaviors during this early contact of the mother with her baby serve a 'checking-out' purpose which is necessary as she becomes acquainted with him. This is a question to pursue further.

Babies were found to be initiators of 70 percent of the interactions, which seems to indicate that they are, indeed, active in getting responses from the very beginning. This implies a need to change the general concept of the new infant's relationship to his environment. Since he is active in interchange with his environment, he needs appropriate sensory input as well as physical care. There are implications here for the utilization of new content for 'infant care' classes. For example, a description of the baby's ways of interacting with his mother and his need for appropriate and contingent responses might be added. There is also need for priority to be given to discovering the most effective ways and best times to communicate this information to mothers.

The last finding revealed by the data analysis was that the independent variables did not seem to have significant influence upon the behavior patterns of either mother or baby. It causes one to wonder whether there may be biological variables, as yet unidentified, that are operant. However, this sample was comprised of bottle-feeding mothers who had all received clinic care. Differences due to these independent variables might be seen in a sample with different characteristics.

Although this study has presented no conclusive evidence about the needs of mothers and babies as interdependent units during hospitalization, it has provided some insights into the ways they behave when they are permitted an extended time together shortly after delivery. It has sparked the author's interest in re-examining the existing data and in analyzing data that were collected but not treated in the context of this report. It has also revealed a number of related avenues to explore, as a means of coming to conclusions about the basic issues.

In a reanalysis of the existing data, different questions might be more useful in achieving the finely-drawn base-line description of mother-baby behavior desired. It is also felt that it would have been advantageous to have had medians and ranges as descriptive elements of the frequency tables. These might yield more useful information. Further, a wider selection of tests for the data analysis would have been available if variables had been defined so as to be mutually exclusive. A grouping of the dependent variables into general categories could make certain kinds of description easier and more definitive. For example, a 'baby' category which combines the 'lip-smacking,' 'moving,' 'mouthing,' 'sighing' sequence would be useful in aiding description of the ways in which the independent variables influence a behavior pattern.

Much more data was collected than was utilized in answering the questions specified by this study. For example, 1063 pairs of interacting behaviors were identified. These show what measures a study mother used most when her baby cried, what responses the baby used when he was being rocked as opposed to being patted, etc. These additional data also indicate the various kinds of mother behaviors occurring for each infant behavior and the kinds of infant responses occurring for each mother behavior. There are, also, frequencies for each behavior sub-totalled by thirds of the observation session. It will be of interest to plot these out and discover whether meaningful patterns emerge in respect to the timing of the contact. Finally, these data contain individual mother-baby patterns of behavior that should be studied for the purpose of identifying the independent variables that do seem to influence differences. However, the data bank is too cumbersome to permit an easy way to get at these. This is an important problem to be dealt with in further study.

There were a number of questions for further study suggested by this work. These were:

1. Do mothers generally achieve eye contact with their babies on their initial appraisals of them in the delivery room? Or, would they do so if the situation were set up in a way to facilitate this? What difference would the establishment of immediate eye contact make to the patterning of their subsequent behaviors?

2. Would there be a difference in the proportions of encradling, finger-caressing and palming during extended contact on the delivery day if mothers were specifically encouraged to handle their babies right after birth?

3. Do the sleep patterns of babies remain essentially the same during the early days after birth, or is there less 'cat-napping' on the day of delivery?

4. Does the mother's initial pattern of interacting with her baby change or persist, over the first few weeks of the baby's post-natal life?

5. If groups of mothers who had high baby-handling scores during hospitalization were to be compared with those who did not, would any differences be found in (1) the mother's mode of interacting with her baby, and (2) the baby's progress in mental, motor development, three or four weeks later?

6. If this study were to be replicated, comparing mother-baby couples in the ward and caretaker-baby couples in the nursery, would baby behavior patterns show differences?

7. What are the implications of adequate maternal rest and sleep as a determinant of the mother's behavior toward her baby?

8. Are there circumstances under which babies show greater frequencies of the reflexive tremor, or sighing? Are these beneficial behaviors? Do they occur more or less frequently when the baby's handling by his mother is increased?

9. Are there variables during the labor experience that influence the mother-baby behavior patterns during the immediate postpartum period?

10. What predictive techniques could be developed for use during pregnancy that would help to identify instances in which intervention prenatally, or a specifically designed pattern of mother-baby care post-natally, are indicated?

11. If a 'low-responding' mother were observed on her first post-delivery day, shown how to use 'responding' techniques on her second day, and observed on her third day and later, at weekly intervals -- would the 'teaching' have made any difference either to her interactive pattern with the baby or to his developmental progress?

12. If a longitudinal study were conducted, comparing

'high' and 'low' responding mothers, would there be a relationship between the early ignoring of the baby's signals and ignoring of the child's cues which signal impending behavior problems?

13. While this method and design seemed to be effective in permitting a smoothness and consistency of data collection, there may be other ways to get at the data that would be better. For example, the close and prolonged presence of an observer - and the use of a white observer for black mothers should be considered as biasing factors in this study. What difference in results would emerge if black observers were used with white mothers; if white observers and mothers, and black observers and mothers were used?

14. If this study were to be conducted, using mother-baby pairs on their second or third hospital days, would the behavior patterns be different from the delivery day patterns described in this study? How different or similar would the patterns be if the subjects were breast-feeding couples, middle-class private patients, or LaMaze-prepared couples?

It is clear that a research base is needed as a foundation upon which to structure changes in maternal-newborn nursing practice. Until this is available, practices that permit mothers and babies to be together as desired may be more beneficial to them than the customary practice of separation except for feeding.

CONCLUSIONS

During the past two decades maternal newborn nursing has grown increasingly sophisticated psychologically and technologically. Obstetric and pediatric advances such as fetal monitoring and the use of new intensive care techniques to increase neonatal survival rates have prompted a broadening of nursing practice responsibilities. Consumer demands as well as intra-professional concerns, have been the impetus for the development of measures to increase parent preparation for and participation in the delivery of their baby. Nursing care which, not long ago, tended to focus almost entirely on the physical care of mother and baby, is gradually being extended to encompass the responsibilities of giving emotional and informational support to parents. The shift from a physical care focus can presently be seen most clearly in the management of the mother or parents during pregnancy and labor. Now, due to the considerable interest of child psychologists in infant cognition and in the emerging significance of the developing mother-infant relationship as a foundation for healthy infant growth, it seems logical to expect that different approaches to the nursing management of the mother/baby/family during the puerperium will be tried and adopted. There will be much greater concern with the need to identify and incorporate into practice, ways of helping mothers be good mothers through increased understanding of infant behaviors and needs.

In this exciting era of the infant, maternal-newborn nursing has unique and timely opportunity for important contributions. Many of its practitioners possess invaluable clinical observation skills, and growing numbers of them are also prepared to conduct and supervise independent research. No other group of professional persons with a vested interest in shaping maternity care to meet immediate and future needs has such ease of access to mothers and their newborns, and freedom to modify the current hospital practices in ways that permit scientific investigation. No other group is accepted quite so naturally and for periods of extended contact by mothers.

A time has come when it is possible to lessen the emphasis on achieving a safe delivery of a physically healthy mother and baby, and to increase the emphasis on helping each mother learn how to handle her baby alone - wisely and with confidence. But as Dittman (1968) has pointed out, there is still a lack of description that specifies exactly what goes on between a mother and her baby, who does what to whom in the interaction, and what differences are seen when other caretakers are substituted for the natural mother. "Until all that transpires between the mother and baby in the best of circumstances is comprehended in sufficient detail that it can be confidently reproduced in its entirety, it is impossible to make alternative plans with assurance that none of the essentials has been unwittingly omitted," (p. 2). Also, there is the task of finding effective ways of applying concepts about the newborn's competencies and needs which have been generally accepted for some time although not commonly included in the care and instruction of maternity patients.

This suggested direction for maternal-newborn nursing to take implies the solution of some related problems before the way is clear. Teaching mothers about the care of their babies still has very low priority on many hospital units. Part of the reason for this is that the mother and baby stay such a short time. There are still many questions about the best time to provide the information and the most effective ways to do this. It may be that some mothers will find that help pertaining to the baby's care is more meaningful after discharge. While the availability of resource persons for new parents is almost nonexistent during the first weeks at home after hospitalization, plans could be made for an extension of the hospital nurse's function or for the development of strong maternity programs in public health nursing, if justified by the scientific investigation of such questions.

In summary, it is now recognized that the young infant is:

1. passively reactive
2. spontaneously active
3. an initiator of behaviors
4. in his own way, a problem solver
5. discriminating and preferential toward stimuli
6. in learning, able to show habituation and contingency awareness

7. able to modify his behavior

Since he possesses these competencies, there is need to ascertain that his care reflects the knowledge in order that his overall development is possible at an optimum level.

Maternal-newborn nurses are being called upon to reshape their practice in keeping with the advances that are constantly modifying the management of mothers and newborns. It seems logical to expect that they have important contributions to make to this special area of child psychology, both as utilizers of and contributors to its fund of knowledge.

APPENDIX A

Consent Form:

Subject ______________________________

Hospital I.D.N. ______________________

Medical Procedure No. ________________

Investigator ____________________________________

Date ______________ Time __________________

I authorize the following observation of ____________________
(myself and my baby)

My baby will stay in my room with me for three hours this morning and three hours this afternoon. His (her) behavior such as sleeping, eating, moving about, crying, will be watched and recorded. I understand that I will be able to sleep, visit with others, or handle my baby during this time if I wish to do so. I also understand that, while we may not benefit from this participation, the observations of my baby's behavior will help nurses learn more about the kind of care newborn babies need. Furthermore, it is agreed that, while the information gained from this observation may be used for educational purposes which may include publication, our privacy will be respected.

I have read and understand the above described observation in which my baby and I are to participate and have received a copy of this description.

Signed ____________________________

Witness ___________________________

I, the undersigned, have defined and fully explained this observational procedure to the above patient.

Signed ______________________________

APPENDIX B

THE FAMILY CENTERED MATERNITY UNIT

This unit accepts, primarily, mothers and infants who are following normal post-delivery courses. A minority of these patients (21 percent) are the recipients of private care and some preparatory classes to involve them in participation during labor. Mothers who have been delivered by Caesarian Section are also housed on this unit.

'Family-centered' babies are generally kept in the nursery for observation until they are twelve hours old and have been given one feeding by the nurse. If a mother desires to see her baby earlier, her request is granted unless the nursery routine is very 'hectic.'

Normal infants, being placed on the family-centered schedule, are brought to their mothers in time for the 10 A.M. feeding and remain until after the 6 P.M. feeding, as long as the mother wishes this and neither have needs for observation or treatment that would interfere. The babies are carried out again at 10 P.M. for feeding, and at 6 A.M. Any mother who would like to feed her baby at 2 A.M. may do so.

The nursing personnel (generally nursing assistants) show each mother where to find things in the baby's crib that will be needed for his general care. They take two bottles of formula for each mother when bringing the babies out in the morning, and explain that one should be used then and one fed to him at 2 P.M. They emphasize that a fresh bottle should be used for each feeding.

Instructions concerning the care of a newborn infant focus on his physical care and safety. There is no particular emphasis on his needs pertaining to immediate attention to his cries, or for cuddling, rocking, being talked to or stroked.

Each mother may select one person who will be permitted to visit while the baby is with her, at any time. Otherwise, visitors are restricted to an evening period when all babies are back in the nursery.

APPENDIX C

TABLE 36

Summary of Characteristics Used as Independent Variables for Individual Subject Pairs in Study Population

Mother-Infant Pair #	Race	Parity	Infant Sex	Previous Handling of Baby	Mother's Perception of Sleep Adequacy	Mother's Perception of Labor Experience	Baby's Age in Hours at Onset of Data Collection
1.	Bl	Mp	M	N	Y	I	11
2.	W	Mp	F	N	N	B	09
3.	W	P	F	N	Y	B	18
4.	Bl	Mp	F	N	Y	I	09
5.	Bl	Mp	F	N	Y	B	08
6.	Bl	P	F	N	Y	I	17
7.	W	P	M	Y	Y	I	18
8.	W	Mp	F	N	Y	B	18
9.	W	Mp	F	N	Y	B	15
10.	Bl	P	F	N	Y	I	17
11.	W	Mp	F	Y	N	B	10
12.	W	Mp	F	N	Y	I	09
13.	W	Mp	M	Y	N	G	14
14.	Bl	Mp	M	N	Y	B	06
15.	Bl	Mp	F	N	Y	I	03
16.	W	P	F	N	N	B	18
17.	Bl	P	F	N	N	I	06
18.	W	Mp	M	Y	N	B	12

TABLE 36 - continued

Mother-Infant Pair #	Race	Parity	Infant Sex	Previous Handling of Baby	Mother's Perception of Sleep Adequacy	Mother's Perception of Labor Experience	Baby's Age in Hours at Onset of Data Collection
19.	W	Mp	M	N	N	I	07
20.	Bl	P	F	N	Y	B	18
21.	Bl	Mp	M	Y	Y	I	05
22.	Bl	Mp	F	N	N	G	05
23.	Bl	P	F	N	Y	I	07
24.	W	Mp	M	N	N	B	03
25.	W	Mp	M	N	N	G	03
26.	W	Mp	M	N	Y	B	08

Code:

Bl	Black	Mp	Multipara	M	Boy	N	No	G	Good
W	White	P	Primipara	F	Birl	Y	Yes	I	Indifferent
								B	Bad

APPENDIX D

INTERVIEWER ____________________

DATE _______________

AGE OF BABY AT BEGINNING OF
DATA COLLECTION ______________

BASIC IDENTIFICATION DATA

NAME ____________________

AGE __________

PARITY ___________

EDUCATION _______________

MARITAL STATUS __________

CLINIC ATTENDED _________

MIC __________

DATE/TIME OF DELIVERY __________

COLOR __________

OCCUPATION/WAGE-EARNER ________

BABY PLANNED ___________

FEEDING ______________

PRIMARY CARETAKER _____________

MOTHER HAS ALREADY SEEN _______

HELD______ BABY

PROBLEMS WITH PREVIOUS BIRTHS

OTHER CHILDREN: Home or hospital delivery __________________

How fed __________________

Primary caretaker __________________

Health/behavior problems __________________

LABOR: TIME OF ONSET _________

DURATION _____________

ANALGESIA _____________

ANESTHESIA ____________

TYPE OF DELIVERY ______

EPISIOTOMY ____________

HOURS SINCE LAST 'NORMAL'
NIGHT SLEEP ________________

POST DELIVERY CONDITION

MOTHER ____________

BABY _______________

WEIGHT ______________

APGAR _______________

BATH TIME ____________

FIRST FEEDING _______

PHYSICAL EXAM _______

SEX _________________

MOTHER'S COMMENTS ABOUT LABOR
EXPERIENCE:

____

____

____

____

APPENDIX E

Development and Use of a Tool to Improve Accuracy in Observing and Recording Human Interactive Behavior:

The proposal for this study specified that each mother-baby pair be observed over a six-hour period on the day of delivery according to a time schedule which required ten-second observation units and twenty-second units for recording, for a total of 480 observations for each subject pair. The problem concerning this author was twofold. If the 25 mother behaviors and 27 baby behaviors were listed over 52 rows of a coding sheet, there would be difficulty finding and checking the appropriate ones for each observation unit in the 20 seconds of recording time allotted. Furthermore, the use of a stop-watch to keep track of the observing and recording periods would, in itself, be a distractor that would use up important time.

For these reasons, two techniques were devised and found helpful in overcoming the difficulties. The first was the development of a 'behavioral variable' scale that listed the mother and baby behaviors on either side of a sliding frame that was separated down the middle just enough to accommodate a double-columned space for recording the 'mother' behaviors in the left column and the 'baby' behaviors in the right column. In this way, the eye could travel back and forth to quickly locate the behaviors of each that needed to be checked off. Another advantage of this frame was that it could be easily slid across the coding sheet from one double column to the next, thus eliminating the necessity for the observer to keep looking back to the left margin to find the desired variable. The frame listed each behavior in descriptive terms (for example, baby: mouthing; moving; eyes shut) and in addition, numbered each variable. Mother variable 'lying in bed' and baby variable 'in crib' were lined up as #1; mother variable 'rocks' and baby variable 'hiccoughs' were both #15. The coding sheet listed the numbers only, down the left margin. This system was effective for the purposes of this study, in providing a means of using the allotted 'recording' time to the best advantage. Figure 3 shows the frame placed on the coding sheet for the recording of the third observation on that sheet.

The second technique was to devise a less cumbersome system of keeping track of 'observation' and 'record' units than the stop-watch. A tape recorder was used as a timer to indicate 'look,' 'record,' 'look,' 'record.' This is not a new device. Such timer mechanisms with and without earphones have been used by other observers of mother-infant behavior (Gewirtz, 1969; Caudill and Weinstein, 1969). It proved most effective in eliminating the worry of 'keeping track' with one's self and in permitting full attention to be given to concentration on the behaviors to be recorded.

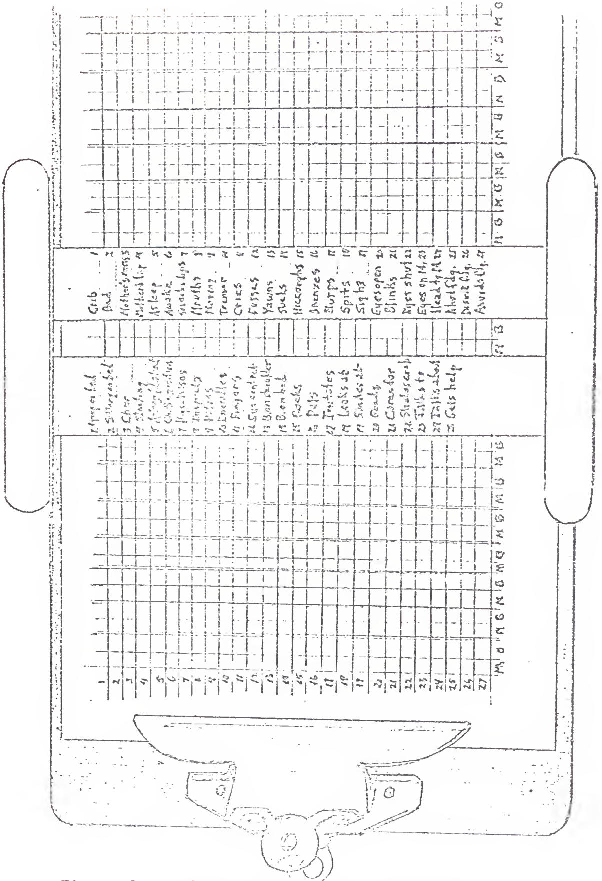

Figure 3. Coding Sheet with Sliding Frame

APPENDIX F

Original List of Dependent Variables

Mother

Lying in bed
Sitting on bed
Sitting in chair
Standing

Attention on baby
Body contact with baby
Distracted
Dozing
Asleep

Fingertip touching
Palming
Encradling
Signalling - eye
Signalling - tactile
Signalling - verbal

Rocks baby
Pats
Bounces
Imitates
Looks at
Smiles at
Feeds
Other caretaking
Shakes crib

Gets help with baby

Infant

In crib
In mother's bed
Held in mother's arms
Held on mother's lap

Awake
Moving
Distracted
Dozing
Asleep

Cries
Fusses
Yawns
Sucks
Roots
Hiccoughs
Sneezes
Burps
Spits
Grimaces
Grunts

Eyes open
Eyes on mother's face
Eyes closed

Turns head to mother

Alert/feeding
Drowsy/feeding
Disinterest/feeding
Avoids/feeding actively

APPENDIX G

Dependent/Independent Variable Combinations Subjected to Analysis of Variance and Found Not Significant:

Dependent Variable	Independent Variable
Baby:	
In mother's lap	Infant sex
Asleep	
Awake	
Fussing (total)	
Fussing (initiating)	
Spits (responding)	
Sighs (total)	
Turns head to mother	
Alert feeding	
Smacks lips (total)	Race
Moving (total)	
Tremor (total)	
Tremor (initiating)	
Tremor (responding)	
Cries (total)	
Fussing (total)	
Fussing (initiating)	
Yawns (initiating)	
Burps (total)	
Turns head to mother	
In mother's bed	Maternal sleep adequacy
In mother's lap	
Awake	
Tremor (responding)	
Cries (total)	
Fussing (total)	
Fussing (initiating)	
Fussing (responding)	
Yawns (total)	
Eyes open (responding)	
Turns head to mother	
In crib	Mother's perception of labor experience
In mother's bed	
In mother's arms	
In mother's lap	
Smacks lips (total)	
Smacks lips (initiating)	
Smacks lips (responding)	

Dependent Variable	Independent Variable
Baby:	
Mouths (total)	Mother's perception of labor experience
Moving (total)	
Moving (initiating)	
Moving (responding)	
Tremor (total)	
Cries (responding)	
Fussing (responding)	
Sighs (responding)	
Sighs (initiating)	
Sucks (initiating)	
Sucks (responding)	
Hiccoughs (total)	
Hiccoughs (initiating)	
Burps (total)	
Spits (responding)	
Eyes open (total)	
Eyes shut	
Eyes on mother's face	
Disinterested feeding	
Asleep	Previous handling of baby
Smacks lips (total)	
Tremor (initiating)	
Tremor (responding)	
Fussing (total)	
Fussing (initiating)	
Sucks (total)	
Spits (initiating)	
Asleep	Parity
Awake	
Smacks lips (initiating)	
Mouths (initiating)	
Mouths (responding)	
Moving (total)	
Cries (total)	
Cries (responding)	
Fussing (responding)	
Sighs (total)	
Sighs (initiating)	
Eyes open (total)	
Turns head to mother	
Mother:	
Lying in bed	Infant sex
Changes baby's position (total)	
Palms (responding)	
Encradles (total)	

Dependent Variable	Independent Variable
Mother:	
Attempts eye contact (total)	Infant sex
Rocks (total)	
Smiles at (initiating)	
Smiles at (responding)	
Cares for (responding)	
Shakes crib	
Talks to (total)	
Talks to (initiating)	
Gets help (total)	
Palms (initiating)	Race
Baby on shoulder (responding)	
Imitates	
Looks at (total)	
Smiles at (responding)	
Changes baby's position (initiating)	
Palms (responding)	
Encradles (responding)	
Baby on shoulder (total)	
Rocks (total)	
Rocks (initiating)	
Imitates	
Smiles at (initiating)	
Feeds (responding)	
Cares for (initiating)	
Cares for (responding)	
Talks to (initiating)	
Lying in bed	Mother's perception of labor experience
Changes baby's position (total)	
Changes baby's position (initiating)	
Hugs, kisses	
Palms (total)	
Palms (initiating)	
Palms (responding)	
Encradles (responding)	
Finger caresses (total)	
Finger caresses (initiating)	
Finger caresses (responding)	

Dependent Variable	Independent Variable
Mother:	
Baby on shoulder (total)	Mother's perception of labor
Baby on shoulder (responding)	
Rocks (total)	
Finger caresses (initiating)	
Looks at (total)	
Looks at (responding)	
Smiles at (responding)	
Feeds (total)	
Cares for (total)	
Cares for (initiating)	
Talks to (total)	
Talks to (initiating)	
Talks to (responding)	
Talks about (total)	
Talks about (responding)	
Inspects	
Palms (total)	Previous handling of baby
Encradles (total)	
Baby on shoulder (initiating)	
Talks to (total)	
Talks about (total)	
Gets help (total)	
Changes baby's position (initiating)	Parity
Encradles (initiating)	
Finger caresses (total)	
Finger caresses (initiating)	
Finger caresses (responding)	
Looks at (total)	
Smiles at (responding)	
Talks about (total)	

APPENDIX

H

TABLE 37

Total and Mean Frequencies and Standard Deviations for Mother Variable - Lying in Bed

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	10200.00	392.31	84.88
Boy	4217.00	421.70	42.14
Girl	5983.00	373.94	100.03
Primipara	3270.00	408.75	67.32
Multipara	6930.00	385.00	92.44
White	5256.00	375.43	97.14
Black	4944.00	412.00	66.61
Handled	1919.00	383.80	95.33
Not Handled	8281.00	394.33	84.65
Sleep	6253.00	390.81	77.00
No Sleep	3947.00	394.70	100.60
Labor:			
Good	1294.00	431.33	36.53
Indifferent	5055.00	421.25	65.57
Bad	3851.00	350.09	97.94

TABLE 38

Total and Mean Frequencies and Standard Deviations for Mother Variable - Sitting on Bed

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	1133.00	43.58	65.12
Boy	229.00	22.90	40.41
Girl	904.00	56.50	75.00
Primipara	247.00	30.88	66.53
Multipara	886.00	49.22	65.61
White	628.00	44.86	69.40
Black	505.00	42.08	62.79
Handled	204.00	40.80	51.49
Not Handled	929.00	44.24	69.05
Sleep	700.00	43.75	57.73
No Sleep	433.00	43.30	78.90
Labor:			
Good	65.00	21.67	20.23
Indifferent	415.00	34.58	62.72
Bad	653.00	59.38	75.35

TABLE 39

Total and Mean Frequencies and Standard Deviations for Mother Variable - Chair

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	178.00	6.85	22.27
Boy	41.00	4.10	9.53
Girl	137.00	8.56	27.64
Primipara	9.00	1.13	3.18
Multipara	169.00	9.39	26.51
White	176.00	12.57	29.61
Black	2.00	0.17	0.58
Handled	12.00	2.40	5.37
Not Handled	166.00	7.91	24.66
Sleep	164.00	10.25	28.03
No Sleep	14.00	1.40	3.78
Labor:			
Good	0.0	0.0	0.0
Indifferent	26.00	2.17	4.80
Bad	152.00	13.82	33.48

TABLE 40

Total and Mean Frequencies and Standard Deviations for Mother Variable - Standing

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	267.00	10.27	22.66
Boy	48.00	4.80	10.24
Girl	219.00	13.69	27.58
Primipara	37.00	4.63	4.72
Multipara	230.00	12.78	26.92
White	230.00	16.43	29.68
Black	37.00	3.08	4.64
Handled	12.00	2.40	3.58
Not Handled	255.00	12.14	24.90
Sleep	202.00	12.63	26.49
No Sleep	65.00	6.50	15.21
Labor:			
Good	0.0	0.0	0.0
Indifferent	52.00	4.33	4.38
Bad	215.00	19.55	33.08

TABLE 41

Total and Mean Frequencies and Standard Deviations for Mother Variable - Sleep

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	7746.00	297.92	90.56
Boy	3247.00	324.70	64.20
Girl	4499.00	281.19	102.08
Primipara	2491.00	311.38	58.67
Multipara	5255.00	291.94	102.57
White	3910.00	279.29	106.05
Black	3836.00	319.67	66.27
Handled	1367.00	273.40	63.79
Not Handled	6379.00	303.76	96.19
Sleep	4686.00	292.88	65.92
No Sleep	3060.00	306.00	124.19
Labor:			
Good	992.00	330.67	48.21
Indifferent	3929.00	327.42	75.25
Bad	2825.00	256.82	102.89

TABLE 42

Total and Mean Frequencies and Standard Deviations for Mother Variable - Changes Baby's Position

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	367.00	14.16	12.58	126.00	4.85	5.68	28.00	1.08	1.35
Boy	115.00	11.50	7.46	47.00	4.70	3.97	17.00	1.70	1.49
Girl	252.00	15.75	14.93	79.00	4.94	6.66	11.00	0.68	1.14
Primipara	109.00	13.63	14.97	31.00	3.88	7.57	4.00	0.50	0.93
Multipara	258.00	14.33	11.84	95.00	5.28	4.82	24.00	1.33	1.46
White	222.00	15.86	12.43	66.00	4.71	4.98	19.00	1.36	1.56
Black	145.00	12.09	12.99	60.00	5.00	6.63	9.00	0.76	1.06
Handled	52.00	10.40	7.06	16.00	3.20	4.66	10.00	2.00	2.12
Not Handled	315.00	15.00	13.55	110.00	5.24	5.93	18.00	0.86	1.06
Sleep	265.00	16.57	13.54	99.00	6.19	5.86	15.00	0.94	1.12
No Sleep	102.00	10.20	10.30	27.00	2.70	4.92	13.00	1.30	1.70
Labor:									
Good	41.00	13.67	6.03	15.00	5.00	6.25	6.00	2.00	1.73
Indifferent	124.00	10.33	12.77	40.00	3.33	6.14	4.00	0.33	0.65
Bad	202.00	18.37	13.10	71.00	6.46	5.09	18.00	1.64	1.50

TABLE 43

Total and Mean Frequencies and Standard Deviations for Mother Variable - Hugs/Kisses

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	19.00	0.73	1.99
Boy	2.00	0.20	0.42
Girl	17.00	1.06	2.49
Primipara	2.00	0.25	0.46
Multipara	17.00	0.94	2.37
White	16.00	1.14	2.63
Black	3.00	0.25	0.62
Handled	1.00	0.20	0.45
Not Handled	18.00	0.86	2.18
Sleep	7.00	0.44	0.73
No Sleep	12.00	1.20	3.12
Labor:			
Good	0.00	0.00	0.00
Indifferent	2.00	0.17	0.39
Bad	17.00	1.55	2.91

TABLE 44

Total and Mean Frequencies and Standard Deviations for Mother Variable - Inspects

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	198.00	7.62	9.74
Boy	49.00	4.90	3.64
Girl	149.00	9.31	11.93
Primipara	34.00	4.25	9.75
Multipara	164.00	9.11	9.63
White	121.00	8.64	11.24
Black	77.00	6.42	7.97
Handled	19.00	3.80	4.98
Not Handled	179.00	8.52	10.45
Sleep	141.00	8.81	9.88
No Sleep	57.00	5.70	9.71
Labor:			
Good	15.00	5.00	4.36
Indifferent	68.00	5.67	8.20
Bad	115.00	10.46	12.00

TABLE 45

Total and Mean Frequencies and Standard Deviations for Mother Variable - Palms

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	386.00	14.85	20.06	10.00	0.38	0.94	9.00	0.35	0.75
Boy	177.00	17.70	27.18	4.00	0.40	1.27	6.00	0.60	1.08
Girl	209.00	13.06	14.79	6.00	0.38	0.72	3.00	0.19	0.40
Primipara	84.00	10.50	16.50	2.00	0.25	0.71	4.00	0.50	1.07
Multipara	302.00	16.78	21.61	8.00	0.44	1.04	5.00	0.28	0.58
White	166.00	11.86	16.90	2.00	0.14	0.36	4.00	0.29	0.83
Black	220.00	18.33	23.50	8.00	0.67	1.30	5.00	0.42	0.67
Handled	89.00	17.80	20.22	4.00	0.80	1.79	5.00	1.00	1.41
Not Handled	297.00	14.14	20.46	6.00	0.29	0.64	4.00	0.19	0.40
Sleep	311.00	19.44	21.58	9.00	0.56	1.15	9.00	0.56	0.90
No Sleep	75.00	7.50	15.64	1.00	0.10	0.32	0.0	0.0	0.0
Labor:									
Good	21.00	7.00	12.12	0.0	0.0	0.0	0.0	0.0	0.0
Indifferent	84.00	7.00	9.50	6.00	0.50	1.24	4.00	0.33	0.65
Bad	281.00	25.55	25.68	4.00	0.36	0.67	5.00	0.46	0.93

TABLE 46

Total and Mean Frequencies and Standard Deviations
for Mother Variable - Encradles

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	1358.00	52.23	51.72	4.00	0.15	0.37	7.00	0.27	0.67
Boy	335.00	33.50	32.82	2.00	0.20	0.42	1.00	0.10	0.32
Girl	1023.00	63.94	58.58	2.00	0.13	0.34	6.00	0.38	0.81
Primipara	474.00	59.26	46.78	0.0	0.0	0.0	1.00	0.13	0.35
Multipara	884.00	49.11	54.77	4.00	0.22	0.43	6.00	0.33	0.77
White	1050.00	75.00	54.62	2.00	0.14	0.36	5.00	0.36	0.84
Black	308.00	25.67	33.53	2.00	0.17	0.39	2.00	0.17	0.39
Handled	199.00	39.80	40.91	0.0	0.0	0.0	0.0	0.0	0.0
Not Handled	1159.00	55.19	54.42	4.00	0.19	0.40	7.00	0.33	0.73
Sleep	1002.00	62.63	58.55	3.00	0.19	0.40	7.00	0.44	0.81
No Sleep	356.00	35.60	34.90	1.00	0.10	0.32	0.0	0.0	0.0
Labor:									
Good	138.00	46.00	7.00	1.00	0.33	0.58	0.0	0.0	0.0
Indifferent	502.00	41.83	48.73	0.0	0.0	0.0	1.00	0.08	0.29
Bad	718.00	65.27	61.13	3.00	0.27	0.47	6.00	0.55	0.93

TABLE 47

Total and Mean Frequencies and Standard Deviations for Mother Variable - Finger Caresses

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	784.00	30.15	31.52	69.00	2.65	3.63	29.00	1.12	1.46
Boy	216.00	21.60	14.09	17.00	1.70	2.11	10.00	1.00	1.05
Girl	568.00	35.50	38.18	52.00	3.25	4.28	19.00	1.19	1.68
Primipara	123.00	15.36	13.18	5.00	0.63	1.06	14.00	1.75	2.12
Multipara	661.00	36.72	35.23	64.00	3.56	4.02	15.00	0.83	0.99
White	517.00	36.93	39.87	46.00	3.23	4.30	15.00	1.07	1.50
Black	267.00	22.25	15.92	23.00	1.92	2.64	14.00	1.17	1.47
Handled	126.00	25.20	19.42	9.00	1.80	1.64	5.00	1.00	1.23
Not Handled	658.00	31.33	34.05	60.00	2.86	3.97	24.00	1.14	1.53
Sleep	490.00	30.63	18.45	50.00	3.13	4.15	22.00	1.38	1.59
No Sleep	294.00	29.40	46.82	19.00	1.90	2.64	7.00	0.70	1.16
Labor:									
Good	86.00	28.67	16.20	6.00	2.00	3.46	2.00	0.67	1.16
Indifferent	252.00	21.00	15.09	18.00	1.50	3.73	18.00	1.50	1.78
Bad	446.00	40.55	44.29	45.00	4.09	3.36	9.00	0.82	1.08

TABLE 48

Total and Mean Frequencies and Standard Deviations for Mother Variable - Eye Contact

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	41.00	1.58	1.60
Boy	22.00	2.20	1.40
Girl	19.00	1.19	1.64
Primipara	4.00	0.50	1.41
Multipara	37.00	2.06	1.47
White	31.00	2.21	1.67
Black	10.00	0.83	1.19
Handled	8.00	1.60	1.82
Not Handled	33.00	1.57	1.60
Sleep	27.00	1.69	1.62
No Sleep	14.00	1.40	1.65
Labor:			
Good	2.00	0.67	0.58
Indifferent	11.00	0.92	1.51
Bad	28.00	2.55	1.44

TABLE 49

Total and Mean Frequencies and Standard Deviations for Mother Variable - Puts Baby on Shoulder

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	257.00	9.88	20.59	1.00	0.39	0.20	2.00	0.08	0.27
Boy	62.00	6.20	11.36	0.0	0.0	0.0	0.0	0.0	0.0
Girl	195.00	12.19	24.79	1.00	0.06	0.25	2.00	0.13	0.34
Primipara	89.00	11.13	15.84	0.0	0.0	0.0	0.0	0.0	0.0
Multipara	168.00	9.33	22.78	1.00	0.06	0.24	2.00	0.11	0.32
White	85.00	6.07	9.20	1.00	0.07	0.27	0.0	0.0	0.0
Black	172.00	14.33	28.69	0.0	0.0	0.0	2.00	0.17	0.39
Handled	42.00	8.40	13.39	0.0	0.0	0.0	0.0	0.0	0.0
Not Handled	215.00	10.24	22.21	1.00	0.48	0.22	2.00	0.10	0.30
Sleep	228.00	14.25	25.31	1.00	0.06	0.25	2.00	0.13	0.34
No Sleep	29.00	2.90	4.63	0.0	0.0	0.0	0.0	0.0	0.0
Labor:									
Good	16.00	5.33	5.03	0.0	0.0	0.0	1.00	0.33	0.58
Indifferent	56.00	4.67	11.52	0.0	0.0	0.0	0.0	0.0	0.0
Bad	185.00	16.82	28.58	1.00	0.09	0.30	1.0	0.09	0.30

TABLE 50

Total and Mean Frequencies and Standard Deviations for Mother Variable - Baby By Side

Independent Variables	FREQUENCIES Total	 Mean	 S.D.
Population	1982.00	76.23	109.11
Boy	469.00	46.90	121.35
Girl	1513.00	94.56	100.37
Primipara	783.00	97.88	107.98
Multipara	1199.00	66.61	111.30
White	718.00	51.29	70.08
Black	1264.00	105.33	139.78
Handled	529.00	105.80	159.91
Not Handled	1453.00	69.19	97.45
Sleep	1683.00	105.19	119.72
No Sleep	299.00	29.90	72.84
Labor:			
Good	8.00	2.67	4.62
Indifferent	1281.00	106.75	130.59
Bad	693.00	63.00	89.81

TABLE 51

Total and Mean Frequencies and Standard Deviations for Mother Variable - Rocks, Shakes, Bounces

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	646.00	24.85	29.58	25.00	0.96	1.54	71.00	2.73	4.13
Boy	345.00	34.50	40.63	10.00	1.00	1.76	26.00	2.60	3.24
Girl	301.00	18.81	19.16	15.00	0.94	1.44	45.00	2.81	4.71
Primipara	215.00	26.88	40.47	7.00	0.88	1.64	12.00	1.50	2.98
Multipara	431.00	23.04	24.70	18.00	1.00	1.53	59.00	3.28	4.50
White	389.00	27.79	34.63	10.00	0.71	1.07	24.00	1.71	2.53
Black	257.00	21.42	23.40	15.00	1.25	1.97	47.00	3.92	5.33
Handled	149.00	29.80	51.89	3.00	0.60	1.34	13.00	2.60	3.44
Not Handled	497.00	23.67	23.40	22.00	1.05	1.60	58.00	2.76	4.36
Sleep	514.00	32.13	31.96	21.00	1.31	1.78	65.00	4.06	4.75
No Sleep	132.00	13.20	22.00	4.00	0.40	0.84	6.00	0.60	1.27
Labor:									
Good	50.00	16.67	12.86	4.00	1.33	1.16	16.00	5.33	7.51
Indifferent	190.00	15.83	18.68	9.00	0.75	1.77	19.00	1.58	3.18
Bad	406.00	36.91	38.64	12.00	1.09	1.45	36.00	3.27	4.05

TABLE 52

Total and Mean Frequencies and Standard Deviations
for Mother Variable - Pats

Independent Variables	FREQUENCIES Behavior Total	 Behavior Mean	 Behavior S.D.	 Initiating Total	 Initiating Mean	 Initiating S.D.	 Responding Total	 Responding Mean	 Responding S.D.
Population	219.00	8.42	11.51	16.00	0.62	0.98	21.00	0.81	1.67
Boy	55.00	5.50	7.12	4.00	0.40	0.70	6.00	0.60	0.84
Girl	164.00	10.25	13.46	12.00	0.75	1.13	15.00	0.94	2.05
Primipara	81.00	10.13	11.13	6.00	0.75	1.04	7.00	0.88	2.48
Multipara	138.00	7.67	11.91	10.00	0.56	0.98	14.00	0.78	1.26
White	156.00	11.14	13.47	11.00	0.79	0.98	9.00	0.64	1.39
Black	63.00	5.25	8.14	5.00	0.42	1.00	12.00	1.00	2.00
Handled	44.00	8.80	8.64	2.00	0.40	0.55	4.00	0.80	1.10
Not Handled	175.00	8.33	12.27	14.00	0.67	1.07	17.00	0.81	1.81
Sleep	136.00	8.50	10.78	10.00	0.63	1.09	17.00	1.06	2.05
No Sleep	83.00	8.30	13.21	6.00	0.60	0.84	4.00	0.40	0.70
Labor:									
Good	21.00	7.00	1.73	4.00	1.33	1.16	1.00	0.33	0.57
Indifferent	69.00	5.75	8.37	5.00	0.42	0.90	9.00	0.75	2.05
Bad	129.00	11.73	15.25	7.00	0.64	1.03	11.00	1.00	1.48

TABLE 53

Total and Mean Frequencies and Standard Deviations for Mother Variable - Imitates

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	10.00	0.38	0.90
Boy	5.00	0.50	0.71
Girl	5.00	0.31	1.01
Primipara	2.00	0.25	0.46
Multipara	8.00	0.44	1.04
White	9.00	0.64	1.15
Black	1.00	0.08	0.29
Handled	1.00	0.20	0.45
Not Handled	9.00	0.43	0.98
Sleep	2.00	0.13	0.34
No Sleep	8.00	0.80	1.32
Labor:			
Good	1.00	0.33	0.58
Indifferent	3.00	0.25	0.62
Bad	6.00	0.55	1.21

TABLE 54

Total and Mean Frequencies and Standard Deviations for Mother Variable - Looks At

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	3923.00	150.88	88.26	0.0			265.00	10.19	6.92
Boy	1485.00	148.50	62.85				109.00	10.90	5.99
Girl	2438.00	152.38	102.99				156.00	9.75	7.59
Primipara	954.00	119.25	60.34				72.00	9.00	6.50
Multipara	2969.00	164.94	96.32				193.00	10.72	7.21
White	2438.00	174.14	99.28				149.00	10.64	7.36
Black	1485.00	123.75	67.56				116.00	9.67	6.65
Handled	847.00	169.40	61.57				49.00	9.80	6.18
Not Handled	3076.00	146.48	94.20				216.00	10.29	7.22
Sleep	2470.00	154.38	77.58				174.00	10.88	7.02
No Sleep	1453.00	145.30	107.48				91.00	9.10	6.97
Labor:									
Good	403.00	134.33	80.41				38.00	12.67	9.29
Indifferent	1466.00	122.17	64.23				141.00	11.75	7.62
Bad	2054.00	186.73	105.64				86.00	7.82	5.25

TABLE 55

Total and Mean Frequencies and Standard Deviations
for Mother Variable - Smiles At

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	379.00	14.58	17.65	3.00	0.12	0.59	64.00	2.46	3.56
Boy	162.00	16.20	10.05	3.00	0.30	0.95	38.00	3.80	4.66
Girl	217.00	13.56	21.35	0.0	0.0	0.0	26.00	1.63	2.47
Primipara	111.00	13.88	28.33	0.0	0.0	0.0	8.00	1.00	1.60
Multipara	268.00	14.89	11.29	3.00	0.17	0.71	56.00	3.11	4.01
White	332.00	23.71	19.57	3.00	0.21	0.80	50.00	3.57	4.20
Black	47.00	3.92	5.04	0.0	0.0	0.0	14.00	1.17	2.13
Handled	75.00	15.00	9.82	0.0	0.0	0.0	18.00	3.60	2.51
Not Handled	304.00	14.48	19.24	3.0	0.14	0.66	46.00	2.19	3.76
Sleep	215.00	13.44	20.71	0.0	0.0	0.0	32.00	2.00	2.73
No Sleep	164.00	16.40	12.02	3.00	0.30	0.95	32.00	3.20	4.67
Labor:									
Good	48.00	16.00	13.00	0.0	0.0	0.0	16.00	5.33	8.39
Indifferent	142.00	11.83	23.22	3.00	0.25	0.87	12.00	1.00	1.96
Bad	189.00	17.18	11.62	0.0	0.0	0.0	36.00	3.27	2.77

TABLE 56

Total and Mean Frequencies and Standard Deviations for Mother Variable - Feeds

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	337.00	12.96	23.44	4.00	0.15	0.61	12.00	0.46	1.03
Boy	94.00	9.40	17.84	1.00	0.10	0.32	3.00	0.30	0.95
Girl	243.00	15.19	26.66	3.00	0.19	0.75	9.00	0.66	1.09
Primipara	229.00	28.63	35.97	4.00	0.50	1.07	8.00	1.00	1.60
Multipara	108.00	6.00	10.42	0.0	0.0	0.0	4.00	0.22	0.55
White	188.00	13.43	16.18	1.00	0.07	0.27	7.00	0.50	0.94
Black	149.00	12.42	30.63	3.00	0.25	0.87	5.00	0.42	1.16
Handled	94.00	18.80	22.25	1.00	0.20	0.45	3.00	0.60	1.34
Not Handled	243.00	11.57	24.02	3.00	0.14	0.66	9.00	0.43	0.98
Sleep	263.00	16.44	28.26	4.00	0.25	0.76	12.00	0.75	1.24
No Sleep	74.00	7.40	11.79	0.0	0.0	0.0	0.0	0.0	0.0
Labor:									
Good	12.00	4.00	6.93	0.0	0.0	0.0	0.0	0.0	0.0
Indifferent	176.00	14.67	30.57	3.00	0.25	0.75	6.00	0.50	1.17
Bad	149.00	13.55	17.53	1.00	0.09	0.09	6.00	0.55	1.04

TABLE 57

Total and Mean Frequencies and Standard Deviations for Mother Variable - Cares For

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	366.00	14.08	13.35	36.00	1.38	3.99	46.00	1.77	2.89
Boy	103.00	10.30	9.91	3.00	0.30	0.95	6.00	0.60	1.08
Girl	263.00	16.44	14.93	33.00	2.06	4.97	40.00	2.50	3.43
Primipara	109.00	13.63	14.64	8.00	1.00	1.60	7.00	0.88	0.99
Multipara	257.00	14.28	13.19	28.00	1.56	4.72	39.00	2.17	3.37
White	178.00	12.71	13.02	24.00	1.71	5.33	19.00	1.36	1.50
Black	188.00	15.67	14.14	12.00	1.00	1.54	27.00	2.25	3.99
Handled	48.00	9.60	7.40	3.00	0.60	1.34	3.00	0.60	0.89
Not Handled	318.00	15.14	14.34	33.00	1.57	4.40	43.00	2.05	3.14
Sleep	308.00	19.25	14.10	36.00	2.25	4.95	38.00	2.38	3.48
No Sleep	58.00	5.80	6.36	0.0	0.0	0.0	8.00	0.80	1.14
Labor:									
Good	25.00	8.33	8.51	4.00	1.33	2.31	4.00	1.33	1.16
Indifferent	137.00	11.42	11.93	6.00	6.50	1.17	20.00	1.67	2.84
Bad	204.00	18.55	15.31	26.00	2.36	5.94	22.00	2.00	3.41

TABLE 58

Total and Mean Frequencies and Standard Deviations for Mother Variable - Shakes Crib

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	347.00	13.35	39.96
Boy	1.00	0.10	0.32
Girl	346.00	21.63	49.71
Primipara	44.00	5.50	8.60
Multipara	303.00	16.83	47.71
White	315.00	22.50	53.36
Black	32.00	2.67	5.74
Handled	1.00	0.20	0.45
Not Handled	346.00	16.48	44.07
Sleep	324.00	20.25	50.10
No Sleep	23.00	2.30	5.60
Labor:			
Good	1.00	0.33	0.58
Indifferent	184.00	15.33	38.67
Bad	162.00	14.73	47.85

TABLE 59

Total and Mean Frequencies and Standard Deviations for Mother Variable - Talks To

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	732.00	28.15	46.28	8.00	0.31	1.05	194.00	7.46	16.32
Boy	138.00	13.80	6.05	8.00	0.80	1.62	25.00	2.50	3.38
Girl	594.00	37.13	57.66	0.0	0.0	0.0	169.00	10.56	20.26
Primipara	131.00	16.38	22.17	0.0	0.0	0.0	30.00	3.75	4.77
Multipara	601.00	33.39	53.42	8.00	0.44	1.25	164.00	9.11	19.31
White	493.00	35.21	55.14	7.00	0.50	1.40	149.00	10.64	20.75
Black	239.00	19.92	33.74	1.00	0.08	0.29	45.00	3.75	8.27
Handled	105.00	21.00	13.58	5.00	1.00	2.24	27.00	5.40	4.72
Not Handled	627.00	29.86	51.24	3.00	0.14	0.48	167.00	7.95	18.08
Sleep	404.00	25.25	30.24	1.00	0.06	0.25	96.00	6.00	7.54
No Sleep	328.00	32.80	66.24	7.00	0.70	1.64	98.00	9.80	25.20
Labor:									
Good	25.00	8.33	3.22	0.0	0.0	0.0	2.00	0.67	1.56
Indifferent	154.00	12.83	17.79	0.0	0.0	0.0	31.00	2.58	3.26
Bad	553.00	50.27	63.78	8.00	0.73	1.56	161.00	14.64	23.55

TABLE 60

Total and Mean Frequencies and Standard Deviations for Mother Variable - Talks About

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	441.00	16.96	15.30	0.0			73.00	2.81	3.16
Boy	166.00	16.60	10.77				26.00	2.60	2.84
Girl	275.00	17.19	17.89				47.00	2.94	3.44
Primipara	72.00	9.00	9.12				18.00	2.25	3.62
Multipara	369.00	20.50	16.33				55.00	3.06	3.02
White	275.00	19.64	18.37				38.00	2.71	3.34
Black	166.00	13.83	10.63				35.00	2.92	3.09
Handled	128.00	25.60	25.99				16.00	3.20	2.95
Not Handled	313.00	14.91	11.59				57.00	2.71	3.27
Sleep	267.00	16.69	9.83				56.00	3.50	3.06
No Sleep	174.00	17.40	22.10				17.00	1.70	3.16
Labor:									
Good	43.00	14.33	8.33				12.00	4.00	3.61
Indifferent	122.00	10.17	8.54				18.00	1.50	2.54
Bad	276.00	25.09	18.99				43.00	3.91	3.39

TABLE 61

Total and Mean Frequencies and Standard Deviations
for Mother Variable - Gets Help

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	55.00	2.12	2.39	0.0			9.00	0.35	0.69
Boy	12.00	1.20	1.81				5.00	0.50	0.97
Girl	43.00	2.69	2.58				4.00	0.25	0.45
Primipara	18.00	2.25	2.55				2.00	0.25	0.46
Multipara	37.00	2.06	2.39				7.00	0.39	0.78
White	34.00	2.43	2.74				7.00	0.50	0.86
Black	21.00	1.75	1.96				2.00	0.17	0.39
Handled	3.00	0.60	0.89				1.00	0.20	0.45
Not Handled	52.00	2.48	2.50				8.00	0.38	0.74
Sleep	40.00	2.50	2.48				4.00	0.25	0.45
No Sleep	15.00	1.50	2.22				5.00	0.50	0.97
Labor:									
Good	2.00	0.67	0.58				1.00	0.33	0.56
Indifferent	16.00	1.33	2.19				2.00	0.17	0.39
Bad	37.00	3.36	2.42				6.00	0.55	0.93

TABLE 62

Total and Mean Frequencies and Standard Deviations for Baby Variable - Crib

Independent Variables	FREQUENCIES Total	 Mean	 S.D.
Population	7114.00	273.62	159.62
Boy	2883.00	288.30	148.13
Girl	4231.00	264.44	168.67
Primipara	2142.00	267.75	189.38
Multipara	4972.00	276.22	150.05
White	3871.00	276.50	144.57
Black	3243.00	270.25	181.46
Handled	1287.00	257.40	190.70
Not Handled	5827.00	277.48	156.06
Sleep	3406.00	212.88	155.43
No Sleep	3708.00	370.80	129.86
Labor:			
Good	1135.00	378.33	45.61
Indifferent	3562.00	296.83	171.12
Bad	2417.00	219.73	153.82

TABLE 63

Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Bed

Independent Variables	FREQUENCIES Total	 Mean	 S.D.
Population	2168.00	83.38	122.80
Boy	549.00	54.90	122.52
Girl	1619.00	101.19	121.14
Primipara	774.00	96.75	125.65
Multipara	1394.00	77.44	124.70
White	798.00	57.00	90.00
Black	1370.00	114.17	150.91
Handled	617.00	123.40	162.89
Not Handled	1551.00	73.86	114.21
Sleep	1846.00	115.38	140.16
No Sleep	322.00	32.20	66.40
Labor:			
Good	50.00	16.67	24.66
Indifferent	1438.00	119.83	154.48
Bad	680.00	61.82	88.77

TABLE 64

Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Arms

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	1157.00	44.50	39.83
Boy	455.00	45.50	37.46
Girl	702.00	43.88	42.44
Primipara	352.00	44.00	49.58
Multipara	805.00	44.72	36.35
White	900.00	64.29	41.32
Black	257.00	21.42	22.56
Handled	259.00	51.80	51.33
Not Handled	898.00	42.76	37.95
Sleep	725.00	45.31	39.94
No Sleep	432.00	43.20	41.78
Labor:			
Good	160.00	53.33	15.18
Indifferent	316.00	26.33	33.51
Bad	681.00	61.91	43.96

TABLE 65

Total and Mean Frequencies and Standard Deviations for Baby Variable - Mother's Lap

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	1569.00	60.35	75.39
Boy	945.00	94.50	96.23
Girl	624.00	39.00	51.50
Primipara	474.00	59.25	97.05
Multipara	1095.00	60.83	66.92
White	912.00	65.14	79.65
Black	657.00	54.75	73.18
Handled	295.00	59.00	116.38
Not Handled	1274.00	60.67	66.29
Sleep	1279.00	79.94	87.98
No Sleep	290.00	29.00	33.32
Labor:			
Good	132.00	44.00	33.96
Indifferent	333.00	27.75	43.93
Bad	1104.00	100.36	93.47

TABLE 66

Total and Mean Frequencies and Standard Deviations for Baby Variable - Asleep

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	9269.00	356.50	62.18
Boy	3832.00	383.20	63.80
Girl	5437.00	339.87	58.31
Primipara	2577.00	322.13	48.05
Multipara	6692.00	371.79	62.71
White	5071.00	362.21	64.88
Black	4198.00	349.83	61.02
Handled	1936.00	387.20	77.70
Not Handled	7333.00	349.19	57.74
Sleep	5545.00	346.56	66.41
No Sleep	3724.00	372.40	54.17
Labor:			
Good	1163.00	387.67	70.94
Indifferent	4160.00	346.67	72.71
Bad	3946.00	358.73	49.32

TABLE 67

Total and Mean Frequencies and Standard Deviations for Baby Variable - Awake

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	2830.00	108.85	57.55
Boy	904.00	90.40	62.31
Girl	1926.00	120.38	53.12
Primipara	1067.00	133.38	67.41
Multipara	1763.00	97.94	50.89
White	1417.00	101.21	50.28
Black	1413.00	117.75	66.18
Handled	438.00	87.60	73.79
Not Handled	2392.00	113.91	53.95
Sleep	1956.00	122.25	59.20
No Sleep	874.00	87.40	53.99
Labor:			
Good	261.00	87.00	63.84
Indifferent	1310.00	109.17	64.56
Bad	1259.00	114.56	51.98

TABLE 68

Total and Mean Frequencies and Standard Deviations for Baby Variable - Smacks Lips

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	1045.00	40.19	35.42	51.00	1.96	2.79	4.00	0.15	0.37
Boy	450.00	45.00	41.09	24.00	2.40	1.78	2.00	0.20	0.42
Girl	595.00	37.19	32.44	27.00	1.68	3.30	2.00	0.13	0.34
Primipara	309.00	38.63	36.49	6.00	0.75	1.49	0.0	0.0	0.0
Multipara	736.00	40.89	35.98	45.00	2.50	3.10	4.00	0.22	0.43
White	444.00	31.71	31.84	33.00	2.36	3.49	3.00	0.21	0.43
Black	601.00	50.08	38.14	18.00	1.50	1.73	1.00	0.08	0.29
Handled	72.00	14.40	15.67	9.00	1.80	1.64	1.00	0.20	0.45
Not Handled	973.00	46.33	36.39	42.00	2.00	3.03	3.00	0.14	0.36
Sleep	646.00	40.38	34.14	27.00	1.69	1.66	2.00	0.13	0.34
No Sleep	399.00	39.90	39.27	24.00	2.40	4.09	2.00	0.20	0.42
Labor:									
Good	157.00	52.33	56.89	11.00	3.67	2.31	1.00	0.33	0.58
Indifferent	406.00	33.83	31.12	10.00	0.83	1.27	1.00	0.08	0.29
Bad	482.00	43.82	36.28	30.00	2.73	3.69	2.00	0.18	0.41

TABLE 69

Total and Mean Frequencies and Standard Deviations for Baby Variable - Mouths/Grimaces

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	2767.00	106.42	58.05	74.00	2.85	6.23	31.00	1.19	2.28
Boy	1165.00	116.50	75.57	16.00	1.60	1.58	9.00	0.90	1.52
Girl	1602.00	100.13	45.59	58.00	3.63	7.84	22.00	1.37	2.68
Primipara	858.00	107.25	59.19	5.00	0.63	1.41	2.00	0.25	0.71
Multipara	1909.00	106.06	59.26	69.00	3.83	7.27	29.00	1.61	2.62
White	1578.00	112.71	62.27	59.00	4.21	8.19	19.00	1.36	2.87
Black	1189.00	99.08	54.46	15.00	1.25	1.91	12.00	1.00	1.41
Handled	435.00	87.00	67.12	11.00	2.20	1.79	4.00	0.80	1.79
Not Handled	2332.00	111.05	56.51	63.00	3.00	6.91	27.00	1.29	2.41
Sleep	1539.00	96.18	48.16	31.00	1.94	2.08	21.00	1.31	2.18
No Sleep	1228.00	122.80	70.78	43.00	4.30	9.83	10.00	1.00	2.54
Labor:									
Good	423.00	141.00	85.25	13.00	4.33	1.53	2.00	0.67	1.16
Indifferent	1143.00	95.25	52.99	6.00	0.50	0.67	10.00	0.83	1.40
Bad	1201.00	109.18	58.00	55.00	5.00	9.14	19.00	1.73	3.17

TABLE 70

Total and Mean Frequencies and Standard Deviations for Baby Variable - Moving

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	4104.00	157.85	68.64	77.00	2.96	3.12	162.00	6.23	7.72
Boy	1954.00	195.40	89.21	36.00	3.60	3.63	56.00	5.60	4.53
Girl	2150.00	134.38	39.37	41.00	2.56	2.80	106.00	6.63	9.30
Primipara	1161.00	145.13	46.89	20.00	2.50	3.38	26.00	3.25	4.59
Multipara	2943.00	163.50	76.90	57.00	3.17	3.07	136.00	7.56	8.54
White	2454.00	175.29	80.34	50.00	3.57	3.20	100.00	7.14	9.14
Black	1650.00	137.50	47.35	27.00	2.25	2.99	62.00	5.17	5.86
Handled	849.00	169.80	92.01	30.00	6.00	3.54	22.00	4.40	4.16
Not Handled	3255.00	155.00	64.44	47.00	2.24	2.61	140.00	6.67	8.36
Sleep	2173.00	135.81	44.62	53.00	3.31	3.18	117.00	7.31	8.36
No Sleep	1931.00	193.10	86.75	24.00	2.40	3.10	45.00	4.50	6.59
Labor:									
Good	639.00	213.00	104.36	15.00	5.00	2.65	25.00	8.33	8.02
Indifferent	1828.00	152.33	57.42	28.00	2.33	3.26	48.00	4.00	5.22
Bad	1637.00	148.82	70.25	34.00	3.09	3.08	89.00	8.09	9.74

TABLE 71

Total and Mean Frequencies and Standard Deviations
for Baby Variable - Tremor/Shudder

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	911.00	35.04	17.95	59.00	2.27	2.57	57.00	2.19	2.98
Boy	370.00	37.00	18.15	29.00	2.90	1.80	22.00	2.20	2.62
Girl	541.00	33.81	18.30	30.00	1.88	2.94	35.00	2.19	3.27
Primipara	334.00	41.75	21.46	21.00	2.63	3.66	11.00	1.38	2.77
Multipara	577.00	30.06	15.92	38.00	2.11	2.03	46.00	2.56	3.07
White	431.00	30.79	16.13	41.00	2.93	2.90	21.00	1.50	2.03
Black	480.00	40.00	19.35	18.00	1.50	1.98	36.00	3.00	3.74
Handled	146.00	29.20	13.37	19.00	3.80	2.17	3.00	0.60	0.80
Not Handled	765.00	36.43	18.88	40.00	1.91	2.57	54.00	2.57	3.19
Sleep	521.00	32.56	18.65	35.00	2.19	2.71	48.00	3.00	3.35
No Sleep	390.00	39.00	16.93	24.00	2.40	2.46	9.00	0.90	1.73
Labor:									
Good	95.00	31.67	1.53	7.00	2.33	1.53	6.00	2.00	3.46
Indifferent	444.00	37.00	20.50	28.00	2.33	3.06	16.00	1.33	2.71
Bad	372.00	33.82	18.24	24.00	2.18	2.40	35.00	3.18	3.13

TABLE 72

Total and Mean Frequencies and Standard Deviations for Baby Variable - Cries

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	76.00	2.92	3.24	35.00	1.35	1.77	6.00	0.23	0.65
Boy	29.00	2.90	3.48	12.00	1.20	1.69	1.00	0.10	0.32
Girl	47.00	2.94	3.19	23.00	1.44	1.86	5.00	0.31	0.79
Primipara	34.00	4.25	4.98	14.00	1.75	2.44	0.0	0.0	0.0
Multipara	42.00	2.33	2.00	21.00	1.17	1.43	6.00	0.33	0.77
White	49.00	3.50	3.65	21.00	1.50	1.79	3.00	0.21	0.43
Black	27.00	2.25	2.68	14.00	1.17	1.80	3.00	0.25	0.87
Handled	16.00	3.20	5.07	8.00	1.60	2.30	1.00	0.20	0.45
Not Handled	60.00	2.86	2.82	27.00	1.29	1.68	5.00	0.24	0.70
Sleep	62.00	3.88	3.69	30.00	1.87	2.00	5.00	0.31	0.79
No Sleep	14.00	1.40	1.51	5.00	0.50	0.85	1.00	0.10	0.32
Labor:									
Good	6.00	2.00	1.73	3.00	1.00	1.00	3.00	1.00	1.73
Indifferent	39.00	3.25	3.36	15.00	1.25	1.82	1.00	0.08	0.29
Bad	31.00	2.82	3.57	17.00	1.55	1.97	2.00	0.18	0.41

TABLE 73

Total and Mean Frequencies and Standard Deviations
for Baby Variable - Fusses

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	543.00	20.88	22.92	195.00	7.50	9.50	29.00	1.16	1.93
Boy	124.00	12.40	14.25	42.00	4.20	3.43	12.00	1.20	1.87
Girl	419.00	26.19	26.00	153.00	9.56	11.47	17.00	1.06	2.02
Primipara	165.00	20.63	26.76	46.00	5.75	7.83	2.00	0.25	0.71
Multipara	378.00	21.00	21.86	149.00	8.28	10.26	27.00	1.50	2.18
White	188.00	13.43	10.68	65.00	4.64	3.69	13.00	0.93	1.44
Black	355.00	29.58	30.10	130.00	10.83	12.90	16.00	1.33	2.43
Handled	38.00	7.60	3.78	16.00	3.20	1.92	3.00	0.60	0.89
Not Handled	505.00	24.05	24.48	179.00	8.52	10.31	26.00	1.24	2.10
Sleep	409.00	25.50	27.49	155.00	9.69	11.31	25.00	1.56	2.30
No Sleep	135.00	13.50	10.09	40.00	4.00	3.80	4.00	0.40	0.70
Labor:									
Good	59.00	19.67	11.93	23.00	7.67	4.04	6.00	2.00	2.65
Indifferent	288.00	24.00	30.40	105.00	8.75	12.42	0.0	0.0	0.0
Bad	196.00	17.82	15.68	67.00	6.09	6.96	23.00	2.09	2.26

TABLE 74

Total and Mean Frequencies and Standard Deviations for Baby Variable - Yawns

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	73.00	2.81	3.41	12.00	0.46	1.21	0.0		
Boy	23.00	2.30	1.89	2.00	0.20	0.42			
Girl	50.00	3.13	4.11	10.00	0.63	1.50			
Primipara	16.00	2.00	3.74	1.00	0.13	0.35			
Multipara	57.00	3.17	3.29	11.00	0.61	1.42			
White	58.00	4.14	3.35	12.00	0.86	1.56			
Black	15.00	1.25	2.86	0.00	0.0	0.0			
Handled	18.00	3.60	4.62	1.00	0.20	0.45			
Not Handled	55.00	2.62	3.17	11.00	0.52	1.33			
Sleep	29.00	1.81	2.79	2.00	0.13	0.34			
No Sleep	44.00	4.40	3.84	10.00	1.00	1.83			
Labor:									
Good	10.00	3.33	2.89	1.00	0.33	0.58			
Indifferent	31.00	2.58	3.94	3.00	0.25	0.45			
Bad	32.00	2.91	3.18	8.00	0.73	1.79			

TABLE 75

Total and Mean Frequencies and Standard Deviations for Baby Variable - Sucks

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	703.00	27.04	37.89	13.00	0.50	1.39	3.00	0.12	0.43
Boy	240.00	24.00	33.38	8.00	0.80	2.20	1.00	0.10	0.32
Girl	463.00	28.94	41.40	5.00	0.31	0.48	2.00	0.13	0.50
Primipara	115.00	14.38	20.01	1.00	0.13	0.35	0.0	0.0	0.0
Multipara	588.00	32.67	42.86	12.00	0.67	1.65	3.00	0.17	0.51
White	337.00	24.07	44.40	10.00	0.71	1.86	3.00	0.21	0.58
Black	366.00	30.50	30.14	3.00	0.25	0.45	0.0	0.0	0.0
Handled	22.00	4.40	5.86	0.0	0.0	0.0	1.00	0.20	0.45
Not Handled	681.00	32.43	40.36	13.00	0.62	1.53	2.00	0.10	0.44
Sleep	534.00	33.38	43.75	6.00	0.38	0.50	2.00	0.13	0.50
No Sleep	169.00	16.90	24.74	7.00	0.70	2.21	1.00	0.10	0.32
Labor:									
Good	104.00	34.67	28.10	8.00	2.67	3.79	0.0	0.0	0.0
Indifferent	418.00	34.83	48.41	1.00	0.08	0.29	0.0	0.0	0.0
Bad	181.00	16.46	25.28	4.00	0.36	0.51	3.00	0.27	0.65

TABLE 76

Total and Mean Frequencies and Standard Deviations for Baby Variable - Hiccoughs

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	151.00	5.81	9.74	21.00	0.81	2.53	0.0		
Boy	31.00	3.10	5.86	3.00	0.30	0.48			
Girl	120.00	7.50	11.38	18.00	1.13	3.20			
Primipara	64.00	8.00	10.54	14.00	1.75	4.56			
Multipara	87.00	4.83	9.51	7.00	0.39	0.50			
White	86.00	6.14	9.46	5.00	0.36	0.50			
Black	65.00	5.42	10.46	16.00	1.33	3.70			
Handled	59.00	11.80	11.71	3.00	0.60	0.55			
Not Handled	92.00	4.38	8.94	18.00	0.86	2.82			
Sleep	89.00	5.56	9.54	19.00	1.19	3.19			
No Sleep	62.00	6.20	10.55	2.00	0.20	0.42			
Labor:									
Good	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Indifferent	78.00	6.50	11.37	16.00	1.33	3.70			
Bad	73.00	6.64	9.12	5.00	0.45	0.52			

TABLE 77

Total and Mean Frequencies and Standard Deviations for Baby Variable - Sneezes

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	88.00	3.38	2.70	40.00	1.54	1.68	0.0		
Boy	27.00	2.70	2.26	15.00	1.50	1.51			
Girl	61.00	3.81	2.93	25.00	1.56	1.83			
Primipara	31.00	3.88	2.74	9.00	1.13	1.36			
Multipara	57.00	3.17	2.72	31.00	1.72	1.81			
White	49.00	3.50	3.00	33.00	2.36	1.87			
Black	39.00	3.25	2.42	7.00	0.58	0.67			
Handled	7.00	1.40	1.14	4.00	0.80	0.84			
Not Handled	81.00	3.86	2.76	36.00	1.71	1.79			
Sleep	69.00	4.31	2.92	28.00	1.75	1.98			
No Sleep	19.00	1.90	1.45	12.00	1.20	1.03			
Labor:									
Good	7.00	2.33	2.08	4.00	1.33	1.53			
Indifferent	36.00	3.00	2.41	11.00	0.92	1.08			
Bad	45.00	4.09	3.15	25.00	2.27	2.05			

TABLE 78

Total and Mean Frequencies and Standard Deviations for Baby Variable - Burps

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	16.00	0.62	0.98
Boy	7.00	0.70	1.16
Girl	9.00	0.56	0.89
Primipara	6.00	0.75	0.89
Multipara	10.00	0.56	1.04
White	12.00	0.86	1.17
Black	4.00	0.33	0.65
Handled	5.00	1.00	1.41
Not Handled	11.00	0.52	0.87
Sleep	8.00	0.50	0.73
No Sleep	8.00	0.80	1.32
Labor:			
Good	3.00	1.00	1.73
Indifferent	2.00	0.17	0.39
Bad	11.00	1.00	1.10

TABLE 79

Total and Mean Frequencies and Standard Deviations for Baby Variable - Spits Up

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	142.00	5.46	17.42	28.00	1.08	1.60	3.00	0.12	0.43
Boy	29.00	2.70	3.43	12.00	1.20	1.81	3.00	0.30	0.68
Girl	115.00	7.19	22.15	16.00	1.00	1.51	0 0	0.0	0.0
Primipara	16.00	2.00	2.33	10.00	1.25	1.83	1.00	0.13	0.35
Multipara	126.00	7.00	20.88	18.00	1.00	1.53	2.00	0.11	0.47
White	127.00	9.07	23.47	15.00	1.07	1.69	3.00	0.21	0.58
Black	15.00	1.25	1.82	13.00	1.08	1.56	0.0	0.0	0.0
Handled	26.00	5.20	3.27	9.00	1.80	2.17	1.00	0.20	0.45
Not Handled	116.00	5.52	19.43	19.00	0.91	1.45	2.00	0.10	0.44
Sleep	114.00	7.13	22.18	15.00	0.94	1.48	1.00	0.06	0.25
No Sleep	28.00	2.80	3.29	13.00	1.30	1.83	2.00	0.20	0.63
Labor:									
Good	6.00	2.00	3.46	3.00	1.00	1.73	0.0	0.0	0.0
Indifferent	101.00	8.42	25.74	9.00	0.75	1.29	0.0	0.0	0.0
Bad	35.00	3.18	2.82	16.00	1.46	1.92	3.00	0.27	0.65

TABLE 80

Total and Mean Frequencies and Standard Deviations
for Baby Variable - Grunts/Sighs

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	1493.00	57.42	27.79	124.00	4.77	4.64	121.00	4.65	5.88
Boy	471.00	47.10	22.85	60.00	6.00	4.74	33.00	3.30	3.13
Girl	1022.00	63.88	29.28	64.00	4.00	4.56	88.00	5.50	7.05
Primipara	590.00	73.75	27.97	24.00	3.00	2.73	36.00	4.50	7.03
Multipara	903.00	50.17	25.14	100.00	5.56	5.15	85.00	4.72	5.52
White	812.00	48.00	26.87	91.00	6.50	5.27	72.00	5.14	5.26
Black	681.00	56.75	30.01	33.00	2.75	2.80	49.00	4.08	6.72
Handled	243.00	48.60	23.46	32.00	6.40	5.18	17.00	3.40	3.91
Not Handled	1250.00	59.52	28.33	92.00	4.38	4.56	104.00	4.95	6.30
Sleep	923.00	57.69	27.88	48.00	3.00	2.83	86.00	5.38	6.04
No Sleep	570.00	57.00	29.14	76.00	7.60	5.66	35.00	3.50	5.72
Labor:									
Good	176.00	58.67	14.22	30.00	10.00	7.00	17.00	5.67	7.23
Indifferent	647.00	53.92	31.51	36.00	3.00	2.41	38.00	3.17	5.72
Bad	670.00	60.91	27.73	58.00	5.27	5.04	66.00	6.00	5.92

TABLE 81

Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes Open

	FREQUENCIES								
	Behavior			Initiating			Responding		
Independent Variables	Total	Mean	S.D.	Total	Mean	S.D.	Total	Mean	S.D.
Population	1827.00	70.27	64.76	21.00	0.81	1.88	9.00	0.35	0.69
Boy	532.00	53.20	53.08	9.00	0.90	1.97	3.00	0.30	0.48
Girl	1295.00	80.94	70.60	12.00	0.75	2.24	6.00	0.38	0.81
Primipara	748.00	93.50	54.91	3.00	0.38	1.06	4.00	0.50	1.07
Multipara	1079.00	59.94	67.53	18.00	1.00	2.14	5.00	0.18	0.46
White	1135.00	81.07	67.71	16.00	1.14	2.41	4.00	0.29	0.47
Black	692.00	57.67	61.58	5.00	0.42	0.90	5.00	0.42	0.90
Handled	381.00	76.20	65.19	5.00	1.00	1.23	1.00	0.20	0.45
Not Handled	1446.00	68.86	66.20	16.00	0.76	2.02	8.00	0.38	0.74
Sleep	1149.00	71.81	71.51	11.00	0.69	1.01	8.00	0.50	0.82
No Sleep	678.00	67.80	55.84	10.00	1.00	2.83	1.00	0.10	0.32
Labor:									
Good	126.00	42.00	44.24	0.0	0.0	0.0	1.00	0.33	0.58
Indifferent	918.00	76.50	77.40	2.00	0.17	0.39	5.00	0.42	0.90
Bad	783.00	71.18	56.72	19.00	1.73	2.65	3.00	0.27	0.47

TABLE 82

Total and Mean Frequencies and Standard Deviations for Baby Variable - Blinks

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	626.00	24.08	15.09
Boy	253.00	25.30	16.38
Girl	373.00	23.31	14.73
Primipara	226.00	28.25	17.55
Multipara	400.00	22.22	14.01
White	323.00	23.07	14.85
Black	303.00	25.25	15.94
Handled	114.00	22.80	6.42
Not Handled	512.00	24.38	16.61
Sleep	367.00	22.94	13.77
No Sleep	259.00	25.90	17.62
Labor:			
Good	98.00	32.67	29.94
Indifferent	263.00	21.92	11.56
Bad	265.00	24.09	14.67

TABLE 83

Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes Shut

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	10214.00	392.85	92.92
Boy	4209.00	420.90	55.29
Girl	6005.00	375.31	108.18
Primipara	3008.00	376.00	78.50
Multipara	7206.00	400.33	99.83
White	5263.00	375.93	101.75
Black	4951.00	412.58	81.23
Handled	1995.00	399.00	68.74
Not Handled	8219.00	391.38	99.17
Sleep	6131.00	383.19	111.24
No Sleep	4083.00	408.30	54.10
Labor:			
Good	1308.00	436.00	45.53
Indifferent	4711.00	392.58	106.81
Bad	4195.00	381.36	88.98

TABLE 84

Total and Mean Frequencies and Standard Deviations for Baby Variable - Eyes on Mother's Face

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	98.00	3.77	6.25
Boy	45.00	4.50	6.82
Girl	53.00	3.31	6.05
Primipara	24.00	3.00	7.69
Multipara	74.00	4.11	5.72
White	92.00	6.57	7.49
Black	6.00	0.50	0.91
Handled	56.00	11.20	10.09
Not Handled	42.00	2.00	3.38
Sleep	56.00	3.50	6.21
No Sleep	42.00	4.20	6.63
Labor:			
Good	3.00	1.00	1.73
Indifferent	20.00	1.67	3.99
Bad	75.00	6.82	7.86

TABLE 85

Total and Mean Frequencies and Standard Deviations for Baby Variable - Turns Head to Mother

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	15.00	0.58	1.42
Boy	12.00	1.20	2.10
Girl	3.00	0.18	0.54
Primipara	0.0	0.0	0.0
Multipara	15.00	0.83	1.65
White	15.00	1.07	1.82
Black	0.0	0.0	0.0
Handled	5.00	1.00	1.73
Not Handled	10.00	0.48	1.37
Sleep	3.00	0.19	0.54
No Sleep	12.00	1.20	2.10
Labor:			
Good	1.00	0.33	0.58
Indifferent	3.00	0.25	0.62
Bad	11.00	1.00	2.05

TABLE 86

Total and Mean Frequencies and Standard Deviations for Baby Variable - Alert Feeding

Independent Variables	FREQUENCIES		
	Total	Mean	S.D.
Population	64.00	2.46	3.88
Boy	9.00	0.90	1.91
Girl	55.00	3.44	4.50
Primipara	31.00	3.88	4.70
Multipara	33.00	1.83	3.42
White	37.00	2.64	3.78
Black	27.00	2.25	4.16
Handled	9.00	1.80	2.49
Not Handled	55.00	2.62	4.18
Sleep	50.00	3.13	4.56
No Sleep	14.00	1.40	2.27
Labor:			
Good	5.00	1.67	2.89
Indifferent	35.00	2.92	4.40
Bad	24.00	2.18	3.76

TABLE 87

Total and Mean Frequencies and Standard Deviations for Baby Variable - Disinterested Feeding

Independent Variables	FREQUENCIES		
	Total	Mean	S.D.
Population	179.00	6.88	15.54
Boy	38.00	3.80	8.40
Girl	141.00	8.81	18.71
Primipara	136.00	17.00	24.97
Multipara	43.00	2.39	5.39
White	87.00	6.21	8.87
Black	92.00	7.67	21.33
Handled	38.00	7.60	11.08
Not Handled	141.00	6.71	16.65
Sleep	146.00	9.13	19.20
No Sleep	33.00	3.30	5.77
Labor:			
Good	2.00	0.67	1.16
Indifferent	107.00	8.92	21.40
Bad	70.00	6.36	9.12

TABLE 88

Total and Mean Frequencies and Standard Deviations for Baby Variable - Avoids Feeding

Independent Variables	FREQUENCIES Total	Mean	S.D.
Population	31.00	1.19	3.99
Boy	18.00	1.80	5.35
Girl	13.00	0.81	2.99
Primipara	12.00	1.50	4.24
Multipara	19.00	1.06	3.99
White	19.00	1.36	4.52
Black	12.00	1.00	3.46
Handled	18.00	3.60	7.50
Not Handled	13.00	0.62	2.62
Sleep	13.00	0.81	2.99
No Sleep	18.00	1.80	5.35
Labor:			
Good	1.00	0.33	0.58
Indifferent	12.00	1.00	3.46
Bad	18.00	1.64	5.10

BIBLIOGRAPHY

Ainsworth, M. D. S. Object relations, dependency and attachment: A theoretical review of the infant-mother relationship. Child Development, 1969, 40, 969-1025.

Ainsworth, M. D. S., and Bell, S. Some contemporary patterns of mother-infant interaction in the feeding situation. In J. A. Ambrose (Ed.) Stimulation in Early Infancy. London: Academic Press, 1969.

Aldrich, C. A., Norval, M. A., Knop, C., and Venegas, F. The crying of newly born babies: IV, A follow-up study after additional care had been provided. Journal of Pediatrics, 1946, 28, 665.

Aldrich, C. A., Sung, C., and Knop, C. The crying of newly born babies: II, The individual phase. Journal of Pediatrics, 1945, 27, 89.

Ashton, R., The state variable in neonatal research: A review, Merrill Palmer Quarterly, Jan. 1973, 19, 3-20.

Barnett, C. R., Leiderman, P. H., Grobstein, R., and Klaus, M. Neonatal separation: The maternal side of interactional deprivation. Pediatrics, 1970, 45, 197-205.

Bell, S. M. The development of the concept of object as related to infant-mother attachment. Child Development, 1970, 41, 291-311.

Bernal, J. Crying during the first ten days of life and maternal responses. Developmental Medicine and Child Neurology, 1972, 14, 362.

Bettelheim, B. Infancy: Where self begins. Child and Family, Winter, 1968, 7, 5-12.

Blauvelt, H. Mother-neonate interaction: Capacity of the human newborn for orientation. In B. M. Foss (Ed.) Determinants of Infant Behavior. New York: John Wiley and Sons, Inc. 1962.

Blauvelt, H. Further studies on maternal-neonate interrelationships. Group Processes. In B. Schaffner (Ed.) Transactions of the Third Conference, Oct. 7-10, 1956. New York: Josiah Macy Foundation, 1956.

Bower, T. The object in the world of the infant, Scientific American, 1971:225, 30-38.

Bowlby, J. Attachment and Loss. Vol. I, Attachment. New York: Basic Books, 1969.

Brazleton, T. B., and Robey, J. S. Observations of neonatal behavior: The effect of perinatal variables, in particular that of maternal medication. Journal of Child Psychiatry, 1965, 4, 613.

Burns, P., Sander, L., Stechler, G., and Julia, H. Distress in feeding: Short-term effects of the caretaker environment of the first ten days. Journal of the Academy of Child Psychiatry, 1972, 11, 427-439.

Cahill, I. D. Childrearing practices in lower socioeconomic ethnic groups. Unpublished doctoral dissertation, Columbia University, 1966.

Caudill, W., and Weinstein, H. Maternal care and infant behavior in Japan and America. Psychiatry, 1969, 32, 12-43.

Cupoli, A., Gorvine, B., Horwitz, M., Kudzma, E., Midura, S. M. J., Mott, S., Ramos, K., and Watson, J. Postpartum teaching regarding infant care, behavior and characteristics: A study. Bulletin of the American College of Nurse-Midwives, 1971, 16, 112-121.

Dittman, L. (Ed.) Early Child Care: New Perspectives. New York: Atherton Press, 1968.

Downs, F. Maternal stress in primigravidas as a factor in the production of neonatal pathology. Nursing Science, Oct. 1964, 348-367.

Fantz, R. L. Visual perception from birth as shown by pattern selectivity. New Issues in Child Development, Annals of the New York Academy of Sciences, 1965, 118, 793-814.

Fantz, R. L., and Nevis, S. Pattern preference and perception: Cognitive development in early infancy. In Child Psychiatry and Child Development. New York: Brunner/Mazel Publishers, 1968.

Frank, L. K. On the Importance of Infancy. New York: Random House, 1968.

Freedman, D. G., Boverman, H., and Freedman, N. Effects of kinesthetic stimulation on weight-gain and on smiling in premature infants. In T. Williams (Ed.) Infant Care: Abstracts of the Literature. Washington: Consortium on Early Childbearing and Childrearing, 1972.

Gewirtz, J. In L. Dittman (Ed.) Early Child Care: New Perspectives. New York: Atherton Press, 1968.

Gewirtz, J. Levels of conceptual analysis in environment-infant interaction research. Merrill Palmer Quarterly, 1969, 15, 7-41.

Goodrich, W. Quoted in Frank, L. K. On the Importance of Infancy. New York: Random House, 1968, 47.

Harlow, H. F. The nature of love. American Psychologist, 1958, 13, 673-685.

Harlow, H. F. Love in infant monkeys. Scientific American, 1959, CC, 68-74.

Harlow, H. F. The heterosexual affectional system in monkeys. American Psychologist, 1962, 17, 1-9.

Harlow, H. F., and Harlow, M. K., and Hansen, E. W. The maternal affectional system of rhesus monkeys. In Rheingold, H. (Ed.) Maternal Behavior in Mammals. New York: Wiley and Sons, Inc. 1963.

Hasselmeyer, E. The premature neonate's response to handling. American Journal of Nursing, 1964, 2, 14-15.

Hersher, L., Richmond, J., Ulrich, A. Modifiability of the critical period for the development of maternal behavior in sheep and goats. Behaviour, 1963, 20, 311-320.

Hess, E. H. Imprinting in animals. Scientific American, 1958, CXCVIII, 81-90.

Jackson, E. Pediatric and psychiatric aspects of the Yale Rooming-In Project on parent-child relationships. American Journal of Orthopsychiatry, 1950, 25, 81-108 and 373-397.

Kessen, W., Williams, J., and Williams, J. P. Selection and test of response measures in the study of the human newborn. Child Development, 1961, 32, 7-24.

Klaus, M., Jerauld, R., Kroger, N., McAlpine, W., Steffa, M., and Kennell, J. Maternal attachment: Importance of the first postpartum days. New England Journal of Medicine, 1972, 286, 460-463.

Klaus, M., Kennell, J., Plumb, N., and Zuehlke, S. Human maternal behavior at the first contact with her young. Pediatrics, 1970, 46, 187.

Knoblock, H. The influence of prenatal and perinatal factors on behavior. Report of the 26th Ross Pediatric Research Conference on Physical and Behavioral Growth, 1958: Ross Medical Company, Columbus, Ohio.

Leifer, A. D., Leiderman, P. H., Barnett, C. R., and Williams, J. A. Effects of mother-infant separation on maternal attachment behavior. Child Development, 1972, 43, 1203-1218.

Levine, S. A further study of infantile handling and adult avoidance learning. Journal of Personality, 1956, 27, 70-80.

Levine, S. Infantile experience and resistance to psychological stress. Science, 1957, CXXVI, 405.

Levine, S. Stimulation in infancy. Scientific American, 1960, CCII, 80-86.

Levine, S. Infantile stimulation: A perspective. In A. Ambrose (Ed.) Stimulation in Early Infancy. New York: Academic Press, 1969.

Levy, D. Primary affect hunger. American Journal of Psychiatry, 1937, XCIV, 643-652.

Lewis, M. Mother-infant interaction and cognitive development: A motivational construct. In T. Williams (Ed.) Infant Care: Abstracts of the Literature. Washington: Consortium on Early Childbearing and Childrearing, 1972a, 41.

Lewis, M. State as an infant-environment interaction: An analysis of mother-infant interaction as a function of sex. Merrill Palmer Quarterly, 1972b, 18, 95-122.

Lorenz, K. Comparative behavior. In J. N. Tanner and B. Inhelder (Eds.) Discussions on Child Development, Tavistock Publication, New York: International Universities Press, 1956, 108-131.

Lorenz, K. Quoted in Ginsburg, B. E. Genotypic variables affecting responses. In A. Ambrose (Ed.) Stimulation in Early Infancy. New York: Academic Press, Inc. 1969.

Morris, M. G. Maternal claiming--identification processes: Their meaning for mother-infant mental health. Parent-Child Relationships. New Jersey: Rutgers University, 1968, 26.

Moss, H. A. Sex, age and state as determinants of mother-infant interaction. Merrill Palmer Quarterly, 1967, 13, 19-36.

Newton, N. Maternal Emotions. Paul B. Hoeber, Inc. New York: Harper Brothers, Publishers, 1955.

Ober, R. E., Horton, R. J. M., and Feemster, R. R. Congenital defects in year of epidemic rubella. American Journal of Public Health, 1947, 37, 1328.

Pasamanick, B., Rogers, M., and Lilienfeld, A. M. Pregnancy experience and the development of behavior disorders in children. American Journal of Psychiatry, 1956, CXII, 613-618.

Pavenstedt, E. (Ed.) The Drifters. Boston: Little Brown and Company, 1967.

Pavenstedt, E., and Sander, L. Progress Report: Mother-Child Interaction During First Three Years. Submitted to USPHS for Grant #M-3325, 1962, 38-42.

Pitkin, R. M., Kaminetzky, H. A., Newton, M., and Pritchard, J. A. Maternal nutrition - a selective review of clinical topics. Obstetrics and Gynecology, 1972, 40, 773.

Rheingold, H. Measurement of maternal care. Child Development, 1960, 31, 565-575.

Ribble, M. The Rights of Infants. New York: Columbia University Press, 1943.

Robson, K. S. The role of eye contact in maternal-infant attachment. Journal of Child Psychology and Psychiatry, 1967, 8, 13.

Rosenblatt, J. S. The basis of synchrony in the behavioral interaction between the mother and her offspring in the laboratory rat. In B. M. Foss (Ed.) Determinants of Infant Behavior III. New York, John Wiley and Sons, Inc., 1965.

Rosenblatt, J. S., and Lehrman, D. S. Maternal behavior of the laboratory rat. In H. L. Rheingold (Ed.) Maternal Behavior in Mammals. New York: John Wiley and Sons, Inc., 1963, 8-57.

Rubin, R. Basic maternal behavior. Nursing Outlook, 1961, 9, 683-686.

Rubin, R. Maternal touch. Nursing Outlook, 1963, 11, 828-831.

Salk, L. The effects of the normal heartbeat sound on the behavior of the newborn infant: Implications for mental health. World Mental Health, 1960, 12, 1-8.

Sander, L. Issues in early mother-child interaction. Journal of the Academy of Child Psychiatry, 1962, 1, 141-166.

Seashore, M. J., Leifer, A. D., Barnett, C. R., and Leiderman, P. H. The effects of denial of early mother-infant interaction on maternal self-confidence. In T. Williams (Ed.) Infant Care: Abstracts of the Literature.

Stern, L. Prematurity as a factor in child abuse. Hospital Practice, May 1973, 117.

Thoman, E., Turner, A., Leiderman, P. H., and Barnett, C. Neonate-mother interaction: Effects of parity on feeding behavior. Child Development, 1970, 41, 1103-1111.

Tinbergen, N. Social Behaviour in Animals. New York: John Wiley and Sons, Inc. 1953.

Wachs, T. D., and Cucinotta, P. The effects of enriched neonatal experiences upon later cognitive functioning. In T. Williams (Ed.) Infant Care: Abstracts of the Literature. Washington: Consortium on Early Childbearing and Childrearing, 1972, 10.

Wolff, P. H. Non-nutritive sucking and response threshholds in young infants. Child Development, 1967a, 41, 631-638.

Wolff, P. H. The role of biological rhythms in early psychological development. Bulletin of the Menninger Clinic, 1967b, 31, 197-218.

Wolff, S. The contribution of obstetrical complications to the etiology of behavior disorders in childhood. Journal of Child Psychology and Child Psychiatry, 1967, 8, 57-66.

BIOGRAPHICAL SKETCH

Mary Elizabeth Hilliard was born on January 26, 1925, in Framingham, Massachusetts. She attended the public schools in Framingham and was graduated in 1942. Her formal and professional education has included the following: graduation from the Massachusetts General Hospital Training School for Nurses in 1946; Bachelor of Science in Nursing degree from The Catholic University of America in 1956; Master of Science in Maternal-Newborn Nursing degree and Certificate in Nurse-Midwifery from Yale University in 1958. Interspersed among educational pursuits she has held numerous staff and supervisory positions in hospitals and in a public health agency, and served five years in the Navy Nurse Corps.

During the years between 1958 and her entrance to the Graduate School of the University of Florida as a full-time student, she was an Assistant Professor of Maternal-Newborn Nursing, first at the University of Wyoming and then at the University of Florida. She is a member of the American Nurses Association, The American College of Nurse-Midwives and Sigma Theta Tau, an honorary nursing society. In January, 1974, she will rejoin the faculty of the University of Florida as an Associate Professor of Nursing.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Ira J. Gordon

Ira J. Gordon, Chairman
Graduate Research Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Vynce A. Hines

Vynce A. Hines
Professor of Education

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Pauline H Barton

Pauline H. Barton
Professor of Nursing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

George J. Warheit

George J. Warheit
Associate Professor of Psychiatry

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Carol Taylor

Carol E. Taylor
Associate Professor of Anthropology

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December, 1973

B J Sharp by MC Baker

Dean, College of Education

Dean, Graduate School